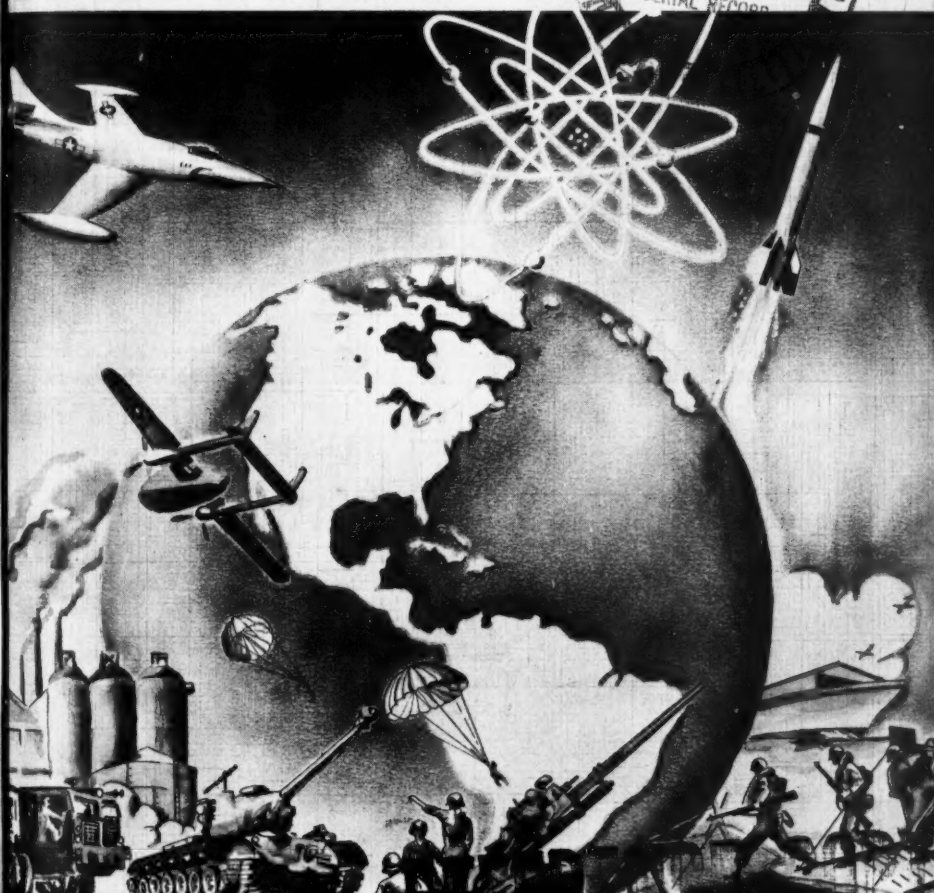


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MILITARY REVIEW



COMMAND AND GENERAL STAFF COLLEGE
FORT LEAVENWORTH, KANSAS

MAY 1951—VOLUME XXXI NUMBER 2



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Command of the Tactical Air Force

Colonel Francis C. Gideon, *United States Air Force*
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THERE appears to be a growing concern among thoughtful officers of the United States Army that the Army erred in relinquishing completely its control over the Air Force during World War II and in supporting The National Security Act of 1947 which severed the Air Force from the Army. This common concern is expressed forcefully in two recent articles: "The Dilemma of Close Air Support for Ground Combat," by Major J. M. Barnum in the MILITARY REVIEW of June 1950; and "Who Should Command the Tactical Air Forces?" by Lieutenant Colonel William R. Kintner in the November 1950, COMBAT FORCES JOURNAL. There is no outright suggestion in either of these articles that the so-called Tactical Air Force should be returned to the Army (though one senses the authors' feelings that this is the best solution to the problem), but each sets forth the case to prove that the air forces supporting ground operations should be under Army command.

Self-evidently, the common concern that these officers express is real. Equally real, however, is the concern felt by those who recognize a dangerous error in the suggestion that the Air Force be divided

in any way. The issues are simple, but they are so basic and the consequences of a wrong decision so grave that they cannot be ignored.

This article is intended as a contribution toward the further examination of this problem on the same constructive plane which characterizes the articles to which I have referred.

To support the case for Army command of the Tactical Air Force are elaborations on the following principal points:

1. Even Douhet, apostle of the primacy of air power, as Colonel Kintner puts it, recognized the need for tactical aviation as an integral part of the Army. We should return to Douhet.

2. The concept of air power as a separate, coequal entity is dangerously fallacious when applied to tactical air operations; the success of air support operations as now conceived by the United States Air Force depends too much on personal relationships between air support and ground commanders.

3. The United States Air Force has subordinated the air support mission to its strategic air warfare mission.

Let us now examine these principal

Air power is not flying artillery or jet-propelled cavalry; it is the sum of the means necessary to dominate the air. To retain its greatest asset, flexibility, the integrity of the US Air Force must be guaranteed

contentions in the light of facts as they are known, experiences of World War II as they relate to the subject, and such guideposts to the future as are visible to us today.

Douhet

The association of Douhet, even briefly, with a suggestion to sever from the Air Force an integral part of its strength is interesting—almost shocking. One might suspect that such association would precipitate an exciting argument, and it probably would, if it were not so easily disposed of. Three quotations from Giulio Douhet's *The Command of the Air*, published in 1927, will suffice to set the record straight:

When the first edition of *The Command of the Air* was published, I thought it wiser not to express all my thoughts on the problems of aeronautics because I did not want to upset too violently the prevailing ideas on the subject. My purpose then was simply to break ground for the acceptance and execution of a minimum program which would have constituted a point of departure for further progress.

I considered it an "error" to keep an auxiliary air force which was incapable of conquering the command of the air, but I admitted its right to existence so as not to upset too violently those whose minds found it too great a leap to abolish the auxiliary air force, the only air force allowed then, and create an independent aviation, an innovation which did not grow out of the war.

Even though I conceded it, I did not want to discuss it then, and in the section on "Auxiliary Aviation" I wrote: "... the responsibility for the organization of the army and navy auxiliary aviation rests with the army and navy. I shall not enter into a discussion of its merits here." Earlier in the same section I said that auxiliary aviation must be: "(1) included in the budgets of the army and navy respectively; and (2) placed absolutely under the direct command of the army or the navy, beginning with their organization and ending with their employment."

As long as I conceded the auxiliary aviation, that stand was perfectly logical; but in making the concession I had in mind a further aim. I thought that when a really worth-while auxiliary aviation had been organized and the army and navy compelled to pay for it out of their own budgets, and their authorities had been obliged seriously to study the organization and employment of it, they would automatically come to the conclusion that such auxiliary aviation was useless—and therefore not only superfluous, but contrary to the public interest.

These are the essential reasons why I did not then, as I do now, state that the only aerial organization whose existence is fully justified is the Independent Air Force.

Considering, then, that, if it seems worth-while, there will be nothing to prevent detaching some of the planes from the Independent Air Force to use as auxiliaries after the command of the air has been conquered, we must logically

conclude that auxiliary aviation is worthless, superfluous, harmful. *Worthless* because incapable of taking action if it does not have command of the air. *Superfluous* because a part of the Independent Air Force can be used as an auxiliary if the command of the air has been conquered. *Harmful* because it diverts power from its essential purpose, thus making it more difficult to achieve that purpose.

In resurrecting Douhet here, it is not intended to suggest that he is infallible nor that his conclusions are not subject to debate. I refer to Douhet because, first, anything he says on air power is worthy of attention even though one may choose to disagree; and, second, if his voice is to be considered authoritative, it should be recorded as favoring an Independent Air Force containing all of a nation's air power; not, as has been suggested, auxiliary aviation for surface forces.

Command Relationships

At the heart of the debate on command relationships, with respect to the Tactical Air Force, is the problem of *support*. The riddle of how to satisfy a man, or a company, or a task force being *supported* has never been solved and it never will. Although the usual infantry-artillery procedure may prescribe otherwise, it is easy to envisage a situation where a ground force commander, confronted with a particular task, will want an artillery group assigned to him for further assignment of battalions and batteries to individual infantry units; an air commander, passing information through navy point-to-point communications, will feel that his traffic is not being handled fast enough, and he will demand separate communications links; a naval commander, supported by an adjacent command's reconnaissance effort, will feel that the coverage is not adequate or sure, and he will demand that necessary reconnaissance be placed under his own direct command; a theater commander, supported by the naval forces of an adjacent theater, will feel that he cannot depend on the support arriving at the right place at the right time, and he will demand direct control over the

supporting forces. Every commander would like to have under his own command all the tools necessary to complete his task, and no one would debate the effectiveness of this arrangement. From the limited point of view of the commander at any particular echelon, there is, as Major Barnum states, no effective substitute for command. There are, notwithstanding this axiom, compelling reasons for subscribing to principles of *co-ordination* and *support* of forces at subordinate levels, and joining forces by *command* at a proper, higher level.

In the operation of military forces of the United States, the basic reason for subscribing to principles of *co-ordination* and *support* is economy. There are not the resources, in the United States, to give every military commander all the tools to do all the jobs he may be called upon to perform. One can be sure that from the Army's point of view, many advantages would accrue as a result of its having, for example, its own rail, air, and sea transport service. The same can be said for the Navy and the Air Force. One could easily go around the circle and make a case for each Service's having, at least to some degree, all the capabilities of each of the others. But a nation, even the United States, cannot afford that. The problem to be decided, then, is not whether there shall be *co-ordination* and *support* but at what echelon it begins.

The Army faced the problem of *command* versus *co-ordination* in World War II, and its decision recognized the existence of air power as an equal partner with land and sea power. Command of air force units was, thereafter, predicated on this recognition. In the theaters of operations were over-all commanders, chosen not principally because of their Service but because of their broad experience. Under these commanders were forces of all Services, and the over-all commander exercised his command through the senior

Service commanders. Orders of the over-all commander prescribed the missions of the component forces, and these missions, almost without exception, included *support* and *co-ordination* for each member of the team for and with each of the other members. We may be sure that the Joint Chiefs of Staff and commanders at all levels understood completely the relative effectiveness of control through *command* and control through *co-ordination*, but consideration of the complexities of each of the Service's problems compelled a deviation from the *command* axiom.

Experience, in World War II, led to the unalterable conclusion that the inherent flexibility of air power is its greatest asset. "This flexibility," says the War Department Field Service Regulations on the subject, "makes it possible to employ the whole weight of the available air power against selected areas in turn; such concentrated use of the air striking force is a battle-winning factor of the first importance."* If air power, designed for the close support of ground combat, had no other function, or if, over an extended period of time, close support operations were the highest priority effort for the Air Force and consumed all its effort, then two strong arguments in favor of its separation from the command of the ground combat commander would be eliminated. The fact is, however, that there are never enough means to do all tasks by completely specialized forces, and the same air power which may, at one time, be employed in close-support operations must at other times—in fact, must first—be employed to attain and maintain the necessary degree of air superiority. Furthermore, there will be times, even in periods of intense ground combat operation, when the ground force commander's requirements for air support will not consume the total effort

* *Command and Employment of Air Power*, 21 July 1943.

of available tactical air forces. The remaining effort should then be concentrated on other lucrative targets.

Though there is no question that a ground force commander, with the proper background of training and indoctrination, can exercise effective command over air force units, there is a question whether it is necessary or desirable for him to do so. A division commander, whose span of interest and control is limited to his division's operations, will certainly have more time to prepare his plans and supervise their execution than the division commander who must also have to concern himself with the details he must necessarily consider in order to command supporting air operations. Of course he is, and must be, concerned that the air support which he requires is provided. There is ample evidence to prove that support by air forces, not under his command, can be rendered effectively.

It must be assumed that any commander entrusted with the operations of forces of any kind must have more than a smattering of knowledge concerning the weapons, tactics, techniques, capabilities, and limitations of those forces. It was recognized, throughout World War II, that air operations are of such a highly specialized nature that flying experience is a requisite for direct command of air operations. Technical advances and rapidly changing techniques in air operations since the War, during a period when similar advances are making army weapons and techniques more complex, make even greater the problem of qualifying officers for command of both Army and Air Force operations.

In this connection, it is pertinent to point out that the line of reasoning which leads to the conclusion that the ground force commander is fully qualified to command air operations also leads to the conclusion that the air force commander is fully qualified to command ground force operations. There may come

an era when the breadth of experience and training will justify such command situations, but considering the rapid expansion which the armed forces must undergo during wartime, it is doubtful that there will be time available to train individuals for command of both air and ground force units. Until it is demonstrated that the necessary training can be accomplished, it is prudent to continue to provide for the direct command of major Service components through experienced Service commanders.

The suggestion that the air support operations of World War II were successful because Army Air Force generals (1) had been "exposed constantly to instruction in the decisive role of land operations" and (2) were "psychologically subordinate to Army Ground Forces generals" is unjustified completely. The fact that the air force commanders accomplished their missions so effectively is a tribute to their understanding of the employment of air power and to their understanding of co-operation. The fact that they were given the opportunity to carry out their operations as an integral part of an over-all air power concept is a tribute to the selflessness of those Army leaders who did not demand subordination, either in a psychological or a real military sense, as a requisite to the welding of a ground force—air force team.

There seems to be a feeling that a ground force commander is completely at the mercy of the supporting air commander when the latter occupies a coordinate position. It appears to be felt that the air commander will or may fail to provide support as requested, ignore targets selected by the ground commander, and knock out targets which the ground commander feels should not be attacked. Concern in this matter may be real, but it ignores the fact that the air commander is not operating in a vacuum, but under a common commander with the ground

force commander whom he supports. The air commander can be relied upon to carry out his orders. It is difficult to visualize a situation where the air commander deliberately ignores his orders and disregards target selections and priorities; but if this occurs, the army commander has swift recourse to the joint commander above. If we assume that the officers of each Service have equal regard for proper military orders, then the major command problem between the supporting and supported forces is that of communications.

Subordination of Air Support to Strategic Air Operations

Such subordination as may be considered to have occurred does not prove that the United States Air Force has abandoned its interest in support for ground force operations, but rather reflects priorities of tasks and limitations of budgets. In planning for national defense, consideration must be given not only to what forces must be employed and what tasks performed, but *when*. Prior to World War II, the basic philosophy of defense of the United States called for a fleet-in-being as the first line of defense, and a mobilization base for the expansion of the Army to prosecute a land war. The relative state of readiness of the Army and Navy did not imply a subordination of the Army's role or an abandonment of interest in its operations. It only reflected an understanding of priorities of tasks. Since there were budget limitations which prevented both the Army and Navy's achieving the desired state of readiness, the priority was given, and properly so, to the Service whose element would first be challenged.

Since the end of World War II, it has been recognized that the Air Force must be prepared to conduct its strategic air warfare mission. Though it would be desirable for all elements of all Services to be at war strength and ready for in-

stant combat, in the United States they cannot be and never will be so. The balance of *readiness* within *Services*, as well as among them, must be based on *priorities of tasks*. The strategy of our national defense, tailored to fit manpower and severe budgetary restrictions, has dictated that special emphasis be placed on the long-range air offensive force. Self-evidently, the ability to perform certain other tasks has been reduced. Great statesmen of the free world testify to the wisdom of this decision and to its stabilizing effect on the world today.

A comparison of the number of Army divisions in being, since the end of World War II, with the number of Air Force groups particularly designated for support operations reveals that a numerical balance has been maintained. On this basis, there is no evidence of subordination by the Air Force of its close combat support role. Regarding efficiency and combat readiness, I am sure there has been left much to be desired—but this observation is certainly applicable with equal force to the ground forces as well as to the Air Force units designed for their support. It is not that Korea has suddenly awakened the Air Force to a need to provide more effective close support any more than it has awakened the Army to a need, to cite one example, for more effective antitank weapons. The need for both has existed and has been clearly recognized. On the basis of efficiency and combat readiness, then, there is, likewise, no justifiable criticism that the Air Force has subordinated its close combat support role.

The Secretary of the Air Force summarized the Air Force's position, with regard to its major tasks, in a recent address before the *New York Herald Tribune* forum. He said, referring to the three major problems facing the Air Force:

First, is the air defense of the United States; to do what we can to prevent an enemy from making a devastating atomic attack upon us—essentially the job of knocking as many enemy bombers out of the air as possible and striking

with our strategic air at the source of the enemy attack.

Second, is tactical air support for the ground forces wherever located. Particularly, our plans involve the use of United States troops to help defend the vital area of the European Continent. American tactical air must see to it that, in conjunction with our Allies, air supremacy over the battlefield is acquired, supplies are denied to the enemy, and powerful and immediate air support is given to our troops in the line. This is an extremely important function of the Air Force.

Third, and the role on which we have been concentrating in the past, and shall continue to concentrate in the future, is the strategic air attack. . . . As long as the nations stay heavily armed, the strategic air attack—our ability to strike with great atomic power at the very centers of an aggressor nation—will be the greatest force for peace in the whole Western world. If we hadn't had this force, we might well have been in a world war by now. The strategic air arm is indispensable to our safety and to the safety of our friends and Allies. So, while we must increase our efforts and our expenditures on these other jobs of which I have spoken, it must never be at the expense of the strategic air.

The lessons of Korea must be evaluated carefully before final conclusions are drawn, but no matter what defects are revealed, the correction will not lie in creating unsound force structures. Already, the suggestion has been made that the Army take over the fighters and fighter-bombers used for the close support of ground troops. It would be equally unsound to correct the weaknesses in the Army's antitank efforts by passing this function to another Service.

Command and Technical Problems

It is interesting to ponder the ground force's problem if the view were to prevail that tactical air should be placed under Army command. First, would the Army solve the problem of training? Not if the attitude of the ground forces in Japan, as reported in *The New York Times*, is representative. The report of a responsible correspondent, on 2 November 1950, states that, ". . . the Air Force had suggested joint air-ground training in Japan prior to the war [in Korea], but the Army was not much interested." It is probable that this attitude is not representative of the feeling of most responsible officers of the Army, but the fact that it exists at all is significant. The need for intensive and thorough joint training must be accepted universally. It is the key to

the success of supporting air operations no matter who exercises command. Command arrangements themselves will not automatically solve the problem of training.

Second, would the Army reach a better solution on equipment? There is no way of knowing, but it seems fair to judge that the knotty, technical problems concerning jet *versus* reciprocating engines, light bombers *versus* fighter-bombers, as well as problems on types of bombs, rockets, and guns would plague whatever Service accepts the responsibility for close-support operations.

Third, would the Army solve the *command* issue to the satisfaction of more than one echelon? The Army would face, once more, the problem as it existed early in World War II, and I am confident that the doctrine enunciated in Field Service Regulations, *Command and Employment of Air Power*, dated 21 July 1943, would be reiterated. It is inconceivable to me that air commands, air forces, groups, or squadrons would be parcelled out to individual ground force units for their exclusive support. Control would be retained at some superior level, and exercised through an air chain of command. The regimental commander, the division commander, the corps commander—the commander of each echelon below the point where control was retained—would still be compelled to look to a co-ordinating commander for support. He would not be satisfied.

Conclusion

If air power were nothing more than flying artillery or jet-propelled cavalry, it would properly be placed under the command of the ground forces. But air power, of which the forces designed for close combat support of ground operations are a part, is more than this. Air power is the sum of the means necessary to dominate the air. Viewed in this light, the reasons for establishing an integrated Air Force are logical and wise; its integrity must be guaranteed.

A Modern Infantry Division

Lieutenant Colonel Donald T. Kellett, *Infantry*
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"The old order changeth, yielding place to new . . ."—Tennyson.

The views expressed in this article are the author's and are not necessarily those of the Department of the Army, the Army War College, or the Command and General Staff College.—The Editor.

UNTIL the violent intervention of the Chinese Reds, a historic and major military triumph had been achieved by our forces in Korea. However, from the limited laboratory constituted by the operations attendant to the liberation of South Korea, a significant question emerges unanswered. Specifically, is our present infantry division organized under Table of Organization and Equipment (T/O&E) 7N good enough for a future war?

At the close of World War II, serious thought was given by the Department of the Army and the Army Field Forces to the reorganization of the United States Army's basic fighting unit, the combat division.

The question may well arise: "Why meddle with the division at all, since apparently our World War II formations fought successfully in achieving a resounding victory?"

In response, it may be stated that the division, in its present composition of balanced combat and service elements, is

a relatively modern innovation. While the term "division" occurs frequently in military history, it had no significance as regards a particular organization, but was used generally to indicate a variously sized body of combat troops, mostly either infantry or cavalry. Such units did not even contain organic field artillery, much less organic elements of the technical services. Not until 1917 did the division, based on our present concept, exist in the United States Army—at which time the 1st Infantry Division was activated in the so-called "square" pattern.

Since a tendency developed, in World War I, to employ the two-regiment infantry brigades (two per division) alternately, and as three or four of the regiments of the division rarely were used simultaneously, the brigade type of organization was discarded. The German triangular (combination of threes) concept became popular and was substituted for it, before World War II, based on its potential for providing additional mobility.

Triangular Shortcomings

However, the triangular division is not necessarily the acme of organizational perfection. The rapid development of communication facilities, for example, makes such restriction unnecessary. Early

Efficient military establishments depend partially upon the continued improvement of combat forces. Table of Organization and Equipment '7X' is one solution for making our infantry divisions more powerful

World War II action in Tunisia frequently found division commanders directly controlling battalion-size task forces in multiples of five or more. Usually this situation occurred during those periods when the enemy held the initiative. Even after the Allies passed to the offensive, it was apparent that triangular divisions had definite offensive limitations. Specifically, three offensive components were insufficient for the many missions assigned to divisions. The order of battle records of the European Theater of Operations reveal that corps commanders reinforced some divisions by cannibalizing others on a wholesale scale. Battle groups or "task forces" became a standard organizational technique.

But why was all this horse trading necessary, recalling that one division could be strengthened only at the expense of another?

One possible answer, bordering upon the sacrilegious, may be set forth: that early in the conflict, the complexity of World War II combat made the triangular division obsolescent.

In planning for a future war, undue reliance upon past experience may be more dangerous than a complete disregard for lessons learned therefrom.

And World War III is a distinct possibility in the foreseeable future.

Considering that the United States invariably wages war only after the enemy has attacked, a certain proportion of our military potential is, therefore, neutralized. Specifically, reference here is made to the prophylactic capability possessed by the considerable strategic elements of the Air Force and Navy. While these forces, thereafter, are factors of great potency, the gravest burden devolves inevitably upon the ground combat arms of the United States Army when the long "road back" is embarked upon. Moreover,

in consideration of our great logistical obligations, both to ourselves and to the free nations of the world, our manpower resources probably will be numerically inferior to those of the most likely enemy. Nor is it desirable that we should have a numerical parity of rifles and bayonets at the expense of playing into the enemy's strength.

The Need for Combat Power

Since the Army, sooner or later, will enter the arena as the decisive military force, it is mandatory that our ground divisions must approach perfection in their efficiency. They must be capable of achieving results with a minimum expenditure of men and material. In short, one United States division must possess a *dynamic* potential equal to several of the enemy's. Like the sheep dog who influences the conduct of a large flock, our problem is that of initiative made possible through flexibility.

As aptly expressed by Captain B. H. Liddell Hart, in a recent issue of *The Army Quarterly* (Great Britain): "[The problem] is that of improving the effective power of maneuver by superior flexibility. A more flexible organization can achieve greater striking effect because it has more capacity for:

1. Adjustment to the varying circumstances; and
2. Concentration at the decisive point."

As a result of experience gained in World War II, Army planners began to consider the necessity for revising the organization of the combat division. Their cogitations produced several divergent viewpoints. One group held that a single, all-purpose type of division structure could be established. Others favored the establishment of a series of "type" divisions, such as infantry, armored, airborne, light, cavalry, motorized, and mountain.

The Korean Battle Test

As a result of these extensive deliberations, three basic types of divisions were standardized—infantry, armored, and airborne—and subsequently organized and equipped according to the current tables. An abundance of effort has been expended in this achievement, and all three divisions essentially are sound. Only one type, the new infantry division, has since been partially combat tested, and while apparently successful in operations in Korea before the intervention of the Chinese Communists, certain pertinent factors must be clearly appreciated.

1. The combat test, to date, has been the Korean battlefield, where emphasis has been largely on the *defense*. While the enemy was new, the style of warfare was not, its most recent counterpart being the Tunisian Campaign of World War II. Actually, the full offensive capability of the postwar infantry division has not yet been revealed.

2. The forces opposing us, while successful initially, by virtue of surprise and numerical superiority, were revealed finally to be inferior in quality.

3. We had complete air and naval supremacy during the conduct of our operations.

Again, is the T/O&E 7N infantry division good enough for a future war? All the answers cannot be found in after-action reports from Korea. Conclusions are more difficult to reach since the United States infantry divisions initially did not conform to T/O&E 7N (averaging only 60 percent of assigned strength, for one thing), but rather resembled more the formations of World War II. Against the field test of an *early* World War II situation, the following defects have been hinted at unofficially:

1. The strength of the infantry elements is still disproportionately low. Consequently, the division cannot maintain continuous, effective performance.

2. The artillery fire power organic to the division is not sufficient and prompt reinforcement by corps units and contributions from tactical air are required.

3. Mobility and flexibility have not been exploited fully.

4. The administrative "tail" is not coordinated sufficiently.

Would these deficiencies be equally applicable in the most likely type of future warfare?

Requirements of Future Wars

If the best available intelligence is appreciated, it is likely that the answer will be, decidedly, in the affirmative. By projecting a comparison with our most probable enemy, the following conclusions seem reasonable:

1. The enemy's preponderance in ground forces will place a premium upon the fire power, mobility, and self-sufficiency of our divisions. Less opportunity will exist for mutual support and the shoulder-to-shoulder alignment of units.

2. The terrain over which campaigns will be waged will be vast and open, and frontages assigned to divisions will be greater. As a result, exposed flanks will be the rule rather than the exception. The resources of the infantry division, therefore, must include forces capable of rapid maneuver and considerable shock power to prevent enemy flanking and turning movements as well as infiltration and attack from the rear.

3. Fire power must be augmented to exceed or at least compare favorably with that of the enemy. (The North Koreans' unexpectedly high fire power capability, while far below that of the Soviets', is particularly indicative of what we may expect to face in the future.)

4. Our tactical success will depend upon our ability to seize the initiative *even under defensive conditions* and to exploit every advantage to the utmost. Here again

mobility, fire power, and self-sufficiency are requisites for survival.

5. Even at the division level, our logistical requirements have become excessive. We must devote a greater slice of the division strength to the combat arms. This is largely a matter of resolution and the necessity for sacrificing luxuries. In the end, every soldier will have to be, at least partially, his own G4.

T/O&E "7X"

As a possible solution to this entire problem, T/O&E "7X," a blueprint for a modified infantry division, is presented. Accepting that the adoption of the new table will affect profoundly all aspects of manpower and matériel mobilization, the concept is suggested only to re-emphasize that change is as inevitable as war itself, and that we cannot fight a future conflict with the tools and organization which were barely satisfactory for the last affair.

Expansion of the Combat Arms

Table of Organization and Equipment "7X" requires an increase of approximately 12 percent in personnel and somewhat more in equipment, practically all of which accrues to the combat strength of the division. While the technical and administrative services will complain, these elements of the division must suffice with *minimum modification*. If the enemy, less well-endowed with technical know-how and equipment, can support, within their divisions, a preponderant combat strength, we must, without equivocation, do at least as well.

An analysis of the present infantry division's strength reveals that the personnel in the batteries and companies capable of firing at the enemy total 10,945. Significantly, 42 percent of the division's strength, or 7,851 persons, is composed of command and staff, administrative, and logistically assigned individuals. This represents a terrific supporting slice right

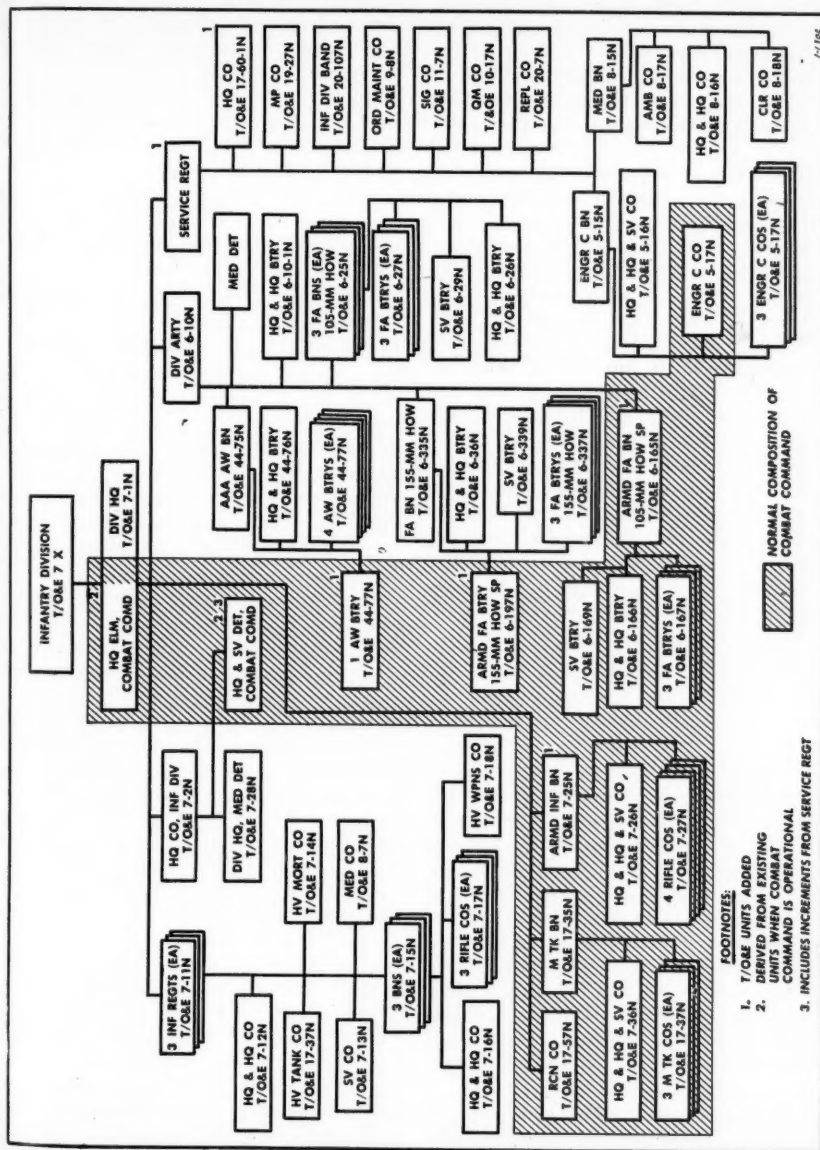
at the front line, almost one man behind each "man behind the gun." And not within the scope of this article is the ever increasing support slice found in the rearward areas, where eventually, on a worldwide basis, nearly seven soldiers support each individual capable of firing or maneuvering against the enemy. Moreover, it is believed, for divisions in contact, our most probable adversary has effectively cut his support slice to 50 percent of our own.

Division "7X" (see chart on page 13) proposes a formation designed to surpass in quality the square and triangular divisions, meanwhile retaining certain desirable features of both. The principal criterion used in developing the proposed infantry division organization was the number of fighting components available within the limitations of efficiency and economy. As expounded by Clausewitz, the commander's span of control exceeds *three* (which is the predominant factor reflected in our present organization). Our system, based upon *threes*, pyramids rearward into a wasteful and inflexible overhead, such as existed in the Mediterranean Theater of Operations in the last War, where a theater headquarters and an army group headquarters were counterbalanced by only two field armies.

A New Combat Characteristic

The World War II infantry division consisted of three identical, similarly performing regimental combat teams, the sum total representing a simple retrogression from the World War I "four of a kind" structure. However, must all "combat teams" have the same characteristics?

The postwar addition to the infantry division of a tank battalion indicates some improvement. By adding an element varying in combat characteristics from those of the infantry regiment, shock power may be increased and employed more easily and more flexibly. But as a



FOOTNOTES:

1. T/O&E UNITS ADDED
2. DERIVED FROM EXISTING UNITS WHEN COMBAT COMMAND IS OPERATIONAL
3. INCLUDES INCREMENTS FROM SERVICE REGT

single, unsupported component (armor), the tank battalion is not sufficient within itself.

However, with the further addition of artillery and infantry, the span of control may be increased to four or five fighting units of varying characteristics. In fact, this latter figure is considered by Liddell Hart to approach the maximum of flexibility and efficiency.

Therefore, "7X" features its own built-in task force of mobile, shock-powered elements, created by the addition of an armored infantry battalion and the equivalent of 1½ battalions of self-propelled artillery. From these increments, it is possible to create a substantial armored combat command, or two balanced formations of lesser strength.

In effect, "7X" has an organic and independent striking force available immediately to exploit success. Yet no sacrifice is made of the infantry division's principal function of taking and holding ground. In fact, these combat increments increase materially the division's capabilities toward this end.

Critics may state at this point that it is common practice to organize task forces as required from the present organic units of the division. However, is this entirely sound?

Normally, the commander fights with three infantry regiments, supported by the division artillery and the division tank battalion. When his objectives exceed his resources—numerically speaking—a task force is formed, strictly an *ad hoc* group. Usually, the components of this group attach themselves, parasitically, to the largest of the headquarters comprising the amalgamation. A staff may or may not be organized.

Meanwhile, what of the rest of the division?

Task Force *Parasite* has nibbled away at the major organic units of the division, impairing their efficiency and re-

tarding their recuperative capabilities. For example, a battalion of infantry, which should have been resting, becomes one element of the task force. A field artillery battalion, whose power must then be subtracted from the already "barely sufficient" division artillery, is usually another candidate.

These are unsound practices, although their exponents are wont to describe them euphemistically as epitomizing "flexibility."

One last observation before we make a detailed examination of "7X." It exploits flexibility achieved through mobility. Concomitantly, the greater the flexibility, the greater the potential toward dispersion. And the greater the dispersion, the more inconsequential will be the effect of an atomic attack, or the equivalent of those weapons, used tactically.

The New Components

The principal new addition to the division under the proposed "7X" is the battalion of armored infantry. This unit is suggested as a more logical choice than the proposed ranger company which cannot be considered to be more than a gadget, an expensive plaything, which will add little to the division's tactical capabilities in the average type of situation and terrain. The armored infantry battalion, however, is a solid striking force with considerable fire power and maneuverability. Dismounted, armored infantry units can perform ranger-type activities, if required, and still carry out their normal missions. And, in addition, the division will have a substantial *infantry* reserve without depending solely upon the battalions of the three regiments. The latter, as the only forces available, have heretofore fulfilled this role, despite being handicapped by organic limitations and decreased efficiency through continuous commitment.

In rounding out the striking force,

the following units are added in "7X": one 105-mm howitzer battalion, self-propelled; one 155-mm howitzer battery, self-propelled; and one antiaircraft artillery automatic weapons (AAA AW) battery.

The artillery of the division is thereby bolstered by 18 105-mm howitzers; 6 155-mm howitzers; 16 40-mm guns; and 32 caliber .50 machine guns. The artillery fire power thus gained amounts to almost 30 percent, which is considered more equitable to the support requirements of future warfare.

A combat command headquarters, operational when so designated by the commanding general, is established under the leadership of the assistant division commander and contains elements from the division headquarters company, from units of the service regiment, as well as staff officer assistants from division headquarters.

The Combined Services Team

To provide greater efficiency, economy, and security, a service regiment (as distinct from the experimental "special troops" concept of World War II) is created to command the service elements of the division. In effect, here is a "Logistical Command" in capsule form. Just as the principle of the employment of combined arms is accepted as essential to efficient combat performance, the technical service elements are likewise coordinated to effect the principle of combined services. Noncombat attachments are integrated temporarily within the regimental framework in the same manner as an attached corps field artillery battalion becomes an integral portion of division artillery.

The commanding officer of the service regiment becomes the operator for G4. Like the foreman on a large civilian construction job, he does not presume to tell

the engineers how to build their bridges. Rather, he ensures that the job is done in the time and manner most satisfactory to his employer. Comparably, the service regiment commander makes certain that the combat effort is supported efficiently. The service regiment becomes the house-keeping headquarters of the division, operates the division rear headquarters, and controls and administers the rear areas. From its own resources, augmented, as appropriate, by units of the combat elements, the service regiment is responsible for the security of installations between the corps forward boundary and the rear of the combat area to include counter-intelligence and antiguerrilla activities.

Since it is conceivable that, in future warfare, a logistical "bridge" may be devised whereby a high percentage of supplies may bypass the communications zone and be delivered directly to divisions, the service regiment may expand its functions to include some of those performed by army service troops.

The technical services may lament what appears to be a loss of autonomy, although the latter has never been a substitute for the benefits of sound command. While the "technical service channel" remains as insurance against misuse and as a source of technical information, it cannot be seen wherein the quality and efficiency of technical service units will be impaired through command subordination.

Command versus Co-operation

It is held, moreover, that the direct command relationship existing under the commanding officer of the service regiment will prove beneficial to the morale and welfare of the entire command. Further, it will ensure that technical service personnel will preserve, in addition to their special talents, the basic qualities of the foot soldier. Specifically, future warfare most likely will require that

every soldier, regardless of his military occupational speciality, must develop the equivalent field craft of the front-line infantryman, if for no other purpose than to preserve his own life.

Additionally, the dubious technique of "operational control" by special staff officers will have been eliminated, and those individuals restored to their nominal staff duties of advising and supervising (except wherever the prejudicial "two-hat" system continues, as in the case of the engineer and signal officer).

As an example, let us examine the working relationship between the signal company (as a subordinate unit) and the service regiment. The mission of the company is known to the service regiment commander and he directs the commanding officer of the signal company to discharge, without any interference by him, those responsibilities on a standing operating procedure basis (such as to establish and maintain the communications of the division headquarters and to operate the division message center). In this instance, however, the division signal officer has recommended that the signal company commander establish a relay station to a combat team operating well to the flank. The commanding officer of the service regiment, recognizing that such a relay station is vulnerable to enemy infiltration, co-ordinates his resources to provide the necessary support. Engineers, not in direct support elsewhere, are assigned to construct and camouflage a suitable dugout. From his rear area security forces (in this case a company of infantry from the reserve regiment and a battery of AAA AW), the service regiment commander ensures that a patrol will cover the specific area of the relay station. Conceivably, under the loose organization of the present 7N infantry division, the same results might have been achieved, but much more painstakingly, requiring a "crusade" by the commanding of-

ficer of the signal company, a conference between G3 and G4, and a concession by the division engineer. Under "7X," the problem, aside from its technical aspects, becomes a simple matter of command responsibility; direct, time-saving, and economical.

All capabilities of the service regiment cannot be explored and discussed here. The important aspect is the acceptance of the principle that service units are susceptible, at division level, to integration into a co-ordinated command structure dedicated to logistical support.

Power Through Balanced Versatility

Infantry division "7X" is held to combine the desirable staying powers of the present organization, based on T/O&E 7N, together with the striking power of an armored combat command, achieved without an extravagant service outlay. Naturally, minor adjustments in the tables of organization and equipment of certain units will be mandatory. From the viewpoint of balance alone, the "7X" unit is considered superior to that based on 7N, which is largely the World War II infantry division with additional and unbalanced appendages. For example, a division tank battalion has been inserted without considering the additional supporting infantry and artillery increments required. The latter are presently available only by diverting elements from the infantry regiments and division artillery respectively. Such disparity is in contrast to the presently well-balanced structure of the combat team with its organic infantry, tanks, and heavy mortars, supported by artillery and engineers.

Furthermore, it is considered that the structure of infantry division "7X" relieves some of the strain upon the infantry battalions, and will permit a reasonable opportunity for reliefs resulting in increased efficiency.

The extra punch of "7X" is psychologi-

cal in nature. Specifically, if our division is stronger and more flexible than the comparable unit of the enemy, confidence and efficiency are improved. The necessity for Task Force *Parasite* will be diminished, for "7X" contains an organic combat command trained for such missions and it is *completely supported*. Finally, and by no means least in importance, is

a fully co-ordinated service support unit, operating with full economy and efficiency in a rear area whose security is its own responsibility.

With an eye on the hourglass, it is prudent to remember that progress is dynamic. To remain static is impossible—the choice is either to go forward or backward.

NOTICE TO ALL USMA GRADUATES

Volume IX (1940-50) of *Gen. Cullum's Biographical Register of the Officers and Graduates of the United States Military Academy* is now being prepared at West Point. This volume will include the records of all those graduated since 1940, to include the Class of 1950, and will continue the records of all other graduates. Since this 10-year period includes World War II and the war service of the thousands of graduates who served therein, Volume IX will be one of the most important editions yet undertaken. In scope and detail the *Register* has no counterpart as a publication. For many years its successive editions have served as a standard reference in many agencies of the Government, including the Departments of the Army and Air Force; in some of the best public libraries of the Nation, including the Library of Congress; and in the private libraries of many West Pointers and friends of the Academy.

Since the best source of information about a graduate's record is the graduate himself, a comprehensive form to obtain this information was mailed last fall by the Superintendent, United States Military Academy, to every graduate whose address was then known at West Point. More than 7,000 individual records, including many from Korea, already have been received and are being processed at the Academy.

But in these times of sudden changes in the addresses of many officers, the Superintendent's request probably has failed to reach a substantial number of graduates whose records are needed to complete the book. Any West Point graduate who has not yet received the Superintendent's request should send a note to *The Editor, Cullum's Biographical Register, West Point, N.Y.*, stating his present mailing address and a form will be sent to him by return mail.

This edition of the *Register* must soon go to press. In these circumstances, prompt action by each graduate is essential to ensure inclusion in the book of his complete record for the period 1941-50.

Thoughts on the American Airborne Effort in World War II

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The views expressed in this article are the author's and not necessarily those of the Department of the Army, the Army War College, or the Command and General Staff College.

This is the second of a series of two articles on this subject. The first article of this series appeared in the April issue.—The Editor.

Airborne Logistics

AIR supply procedures in early operations left much to be desired, and any operation such as that planned for *Arena* (the establishment of an independent airhead east of the Ruhr) would have strained the supply organizations existing near the end of the War. Based on its experiences, through November 1944, the IX Troop Carrier Command recommended the following procedures:

1. Resupply missions for an airborne operation should not be left on an "on call" basis, but should be planned and scheduled to meet the maximum requirements of the airborne division. These supplies should be packed and distributed to departure fields before the operation, and a reserve of unpacked supplies, parachutes, and containers should be available.
2. An air supply depot should be established in each wing area to receive and package the supplies.
3. Adequate loading teams should be organized to load the aircraft and accompany the planes to eject the bundles.
4. Close co-ordination with the tactical

air forces for the use of forward delivery airfields is necessary, and front-line control for incoming aircraft is needed.

5. Plans should include the possible use of fighter-bombers for emergency deliveries.

Other recommendations included the establishment of an allocations and priority organization under the Supreme Commander, the formulation of plans for the use of airfields for nontactical supply operations, and concrete suggestions for improvements in aircraft cargo carrying capacities.

As yet undetermined was the type of logistical organization which should handle supplies in an airhead established in a large-scale operation. The United States had developed no equivalent of the British Airborne Forward Delivery Airfield Group, but even that organization hardly could have handled supplies for a large airhead. Something equivalent to port battalions and other communications zone organizations would have been needed for that kind of an operation.

Application of Doctrine

Actually, many questions on the principles to govern the employment of airborne troops had to be left only partially answered, for in spite of an impressive listing of airborne operations in World War II, airborne experience was insufficient to give conclusive answers to many fundamental questions. Efforts to arrive at sound principles on the basis of one

or two or even no experiences are bound to be strained. Frequent reference to such-and-such an operation as "proof" of a particular generalization more than likely reflected a preconceived notion seeking justification—which might have been sound enough in itself though the quality of its factual proof might be doubted. At the same time, many of the principles should have been so obvious as to make learning the hard way unnecessary. Flexibility usually seems a safer rule in military affairs than hard and fast principles. This becomes especially true when new means of warfare are being considered. Too firm an attachment to concepts, previously stated, may lead to a dogmatism which denies the full exploitation of all the possibilities in new methods. Getting the maximum force on the ground in a minimum of time was a well-established principle of airborne operations. Special conditions on Corregidor, however, made it necessary to violate that principle in having troop carriers make several passes over the target area so that paratroops could hit the tiny drop zone.

Even the hallowed principles of war deserve fresh consideration from time to time. The principle of mass, for example, appeared, nearly always, in official statements of doctrine—airborne troops should be employed in mass. However, the Sicilian and Normandy operations were suc-

ceivable that an airborne division, assigned the missions of destroying enemy communications and supply installations or creating confusion and disorder in enemy rear areas, might accomplish the task better by scattered drops. The losing of 243 well-trained, skilfully led squads, as separate patrols over a widespread area, to cut wires, destroy bridges, disrupt railways, and destroy communications centers and supply depots might create havoc in the enemy rear areas before infiltrating back to friendly lines.

Simplicity is another principle of war. Strict adherence to that maxim would rule out all major airborne operations. Their complexity is one of their distinguishing characteristics. If a commander is disposed to choose always the more simple over the more complex plan, he will, nearly always, choose a ground attack. But if he seeks decisive results, then the extra effort needed to overcome the complexities of mounting an airborne attack may be more than worth while.

It may be a violation of the principle of economy of force to have highly trained and expensively equipped troops, like those which make up airborne and troop carrier units, remain idle. Yet, airborne forces filled two important functions even when they were idle. First, they constituted a strategic threat. Unquestionably, this affected enemy troop dispositions.

Strategic planners, developing our military doctrine, organization, and policies, must study World War II history to determine whether future expenditures of men and matériel for airborne operations are justified

cessful even though the drops were scattered. In fact, they may have been successful, in part, because they were scattered. When airborne troops are to be used against immediate defense areas, it may be better to have them scattered than concentrated to negate the effectiveness of counterattacks. Further, it is con-

Indeed, the German commanders almost gave a "sigh of relief" when our airborne troops were committed in Holland. Even then, they were still uneasy about the possible employment of the 17th Airborne Division. Again, in the Ardennes, the Germans were relieved when they learned that the 17th, 82d, and 101st Airborne

Divisions were being committed on the ground. General Student, the German parachute commander, stated, after the War, that the very existence of airborne units within the Allied armies was an important factor for German leaders to consider, for it compelled them to hold out large reserves on all fronts in order to cope with the anticipated use of those forces. This single factor, he said, figured greatly in destroying flexibility in committing German units.

Second, airborne troops held out of action formed an effective strategic reserve to meet emergencies. The best reserve was one made up of excellent troops, and one which could be committed quickly to battle in any sector. Airborne divisions filled those requirements admirably. They could be training and preparing for future operations and yet be committed, on short notice, anywhere in the theater. Committed to action, they could have a decisive influence. The parachute reinforcement of the Salerno beachhead, and the air movement of the 17th Airborne Division to the Continent during the Battle of the Bulge, indicated the advantages of using airborne troops for such emergencies. The airborne divisions which were in SHAEF reserve at the time of the German counteroffensive in the Ardennes had an important influence on the outcome of that operation. The question can be raised whether any effective theater reserve would have been on hand at all had not those divisions been airborne and, thus, had a special plea for being released from continuous ground action.

Organization and Control

The organization of airborne units usually was based, first, upon the limitations of air transportation and, second, upon the ground roles which the units should be expected to fill. As organized originally, the parachute infantry rifle platoon had only two rifle squads—each

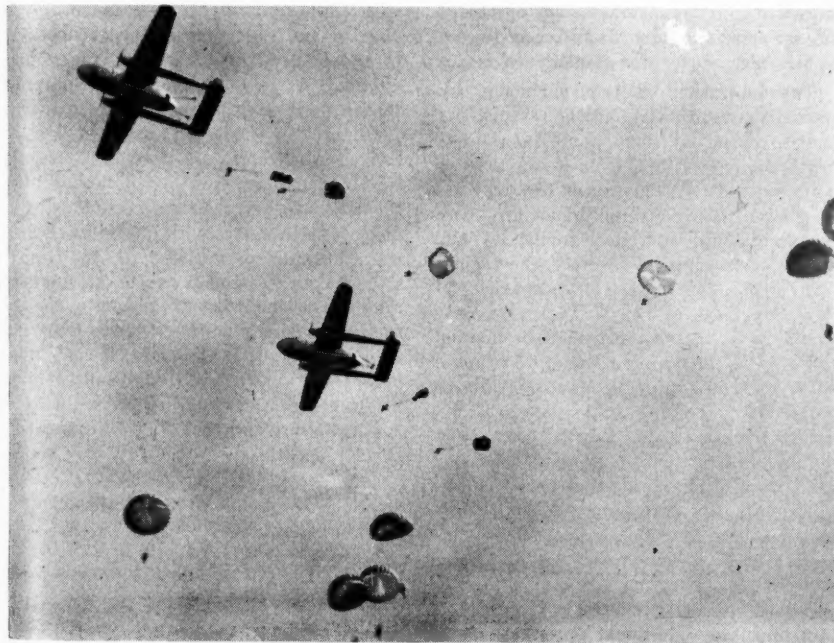
equipped with a light machine gun—and a 60-mm mortar squad. No doubt the lack of a third rifle squad, and the addition of the machine guns and mortars, was due to an attempt to keep the platoon small to ensure air-transportability and yet provide it with its own weapons so that, in a parachute drop, it would not have to rely on the uncertain proximity of a separate weapons platoon. Later, the organization of glider units represented even more of a departure from that of standard infantry units. Glider platoons were similar to standard infantry platoons, but a glider infantry company had only two rifle platoons. Moreover, the glider infantry regiment had only two battalions.

The disregard, in the small unit organization, of standard American tactical doctrine (which was based upon a triangular organization) made it necessary for commanders either to improvise new tactics or new units. The Army Ground Forces had insisted that airborne troops should fight as other infantry units—that air was simply another means of transporting them to the battlefield. But the disparity in organization between airborne and standard infantry units, and the lack of consistency between the parachute and glider organizations, made the application of any uniform tactical doctrine extremely difficult. It, doubtless, would have been better to have fewer parachute and glider units, and have them organized along standard triangular lines, than to have many units with such an apparently incomplete organization. This was the position of airborne commanders after combat experience. Surely, such shortcomings in organization were obvious from the start. It was not until they had been "proved" repeatedly in combat, however, that modifications were made.

These same tendencies appeared in the organization of the airborne division. At first, airborne thinking included no place

for the airborne division as such. On the contrary, the assumption was that parachute regiments could be attached to standard infantry divisions in any airborne operation employing units of that

General McNair's dictum, that the airborne division "should be evolved with a stinginess in overhead and in transportation which has absolutely no counterpart thus far in our military organization,"



Paratroopers from the 82d Airborne Division jumping in a drop zone during a training exercise. The men jumped in "double sticks" from an altitude of 800 to 1,000 feet.

size. Then, noting the German organization of parachute divisions and the implications of the capture of Crete as well as British experience in the organization of airborne divisions, which included both parachute and glider troops, Army Ground Forces accepted the idea of the airborne division as a distinct type of organization to be specially trained and equipped. Again, emphasis was placed upon keeping down its size and equipment in conformity with requirements for air transportation.

imposed severe limitations on the activities of those divisions. The lack of transportation, for example, posed a continuous, irritating problem in moving troops to training areas and in meeting administrative problems. As of October 1943, the airborne division had a total of 415 motor vehicles—mostly jeeps. It had 82 $2\frac{1}{2}$ -ton trucks and 22 $\frac{3}{4}$ -ton trucks. The standard infantry division, of course, was considerably larger (14,248 officers and men compared with 8,520 for the airborne division), but its proportion of motor

vehicles was much greater. The standard infantry division had 1,423 motor vehicles, including 386 2½-ton trucks, 107 1½-ton trucks, and 22 4-ton trucks. Thus, it was necessary for airborne units to borrow trucks, or for special truck units to be attached to it, in order to carry out training missions and administrative tasks, and to provide support for combat action.

The limitation on transportation, apparently, was based on the assumption that airborne divisions would be relieved from combat within 3 to 5 days after being committed. This never did prove to be the case. The consideration of air-transportability was not, necessarily, a valid one in restricting, so severely, the assignment of 2½-ton trucks. More nearly adequate numbers of heavy trucks not only would have contributed much to making the best use of training time and to more effective unit supply techniques while in garrison or training areas, but such organic transportation might have been invaluable in moving supplies to airfields for resupply missions in airborne operations and for increasing the maneuverability of the divisions' seaborne or land-borne tails when such units were committed to sustained ground action as standard infantry divisions. The normal attachment of additional parachute units to the 82d and 101st Airborne Divisions meant an even greater strain on the authorized transportation of these divisions.

The lack of a reconnaissance platoon, of sufficient military police, and of a satisfactory parachute maintenance organization and signal facilities led airborne division commanders to improvise more adequate organizations. The fact that the actual organization bore little resemblance to official tables of organization was an indication of the inadequacies of the latter. Difficult enough in any military organization, the question of what overhead personnel really were essential was especially troublesome in the airborne division.

Perhaps the "stinginess in overhead and transportation" was overemphasized. Sometimes, reduction in the size of an organization is equated to streamlining, and the illusion of a "streamlined division, trimmed down for high mobility but with tremendous fire power for hard-hitting action," attracts adherents seeking to show the greatest results for efforts applied. Actually, streamlining, carried to the point that it was in the airborne division, may render the organization relatively ineffective. It may be better to have only three battalions, but to have them under control through good communications, supplied with adequate transportation, and operating with the benefit of sufficient reconnaissance than to have nine battalions without adequate control facilities, effective reconnaissance, and support. On the other hand, it may have been General McNair's viewpoint that it would be much easier to add to an organization than to subtract from it, that needs should be clearly demonstrated before granted, and that the more prudent course would be to err on the side of thrift in the initial organization.

Why British practice was not followed in the parachute-glider ratio in the United States airborne division is not clear. Apparently, the American organization was predicated on the concept of using parachute troops as an "arrowhead" to prepare the way for glider landings, and General McNair could not find the reasoning behind the British organization (two parachute brigades and one glider brigade) to justify a change. But no American division ever went into combat with the one-parachute and two-glider regiment organization. The change in ratio of parachute and glider units in the 82d Airborne Division, when it moved overseas, apparently was due as much to the need for conserving shipping space as to any change in concept, for other divisions retained the old organization.

The advantages of using parachute troops over glider troops, in getting a maximum number of men on the ground in a minimum of time, and the smaller number of aircraft and the shorter troop carrier columns needed for parachute troops, impressed airborne planners. The 82d and 101st Airborne Divisions each had an organization amounting to three para-

glider troops as parachutists and reorganized those elements into para-glider units. This approach was recommended for the postwar organization. Replying to the War Department questionnaire on the postwar military establishment, the Army Ground Forces recommended that all personnel in the airborne division be trained both in parachute jumping and glider operations.



An Eighth Air Force *B-24 Liberator* dropping supplies by parachute to airborne forces who had landed, shortly before, east of the Rhine River.—Department of Defense photo.

chute regiments and one glider regiment for both the Normandy and the Holland operations. Recommendations for permanent reorganization were made after each operation and, in December 1944, the War Department authorized the two-parachute to one-glider unit structure for the airborne divisions in the European Theater. They reorganized in the spring of 1945.

The 11th Airborne Division, in the Pacific, had approached the problem in a different way. It had trained some of its

Serious doubts concerning the value of airborne divisions arose after the Sicilian operation. In the background, the earlier concept of organizing special task forces around smaller airborne units for each specific operation persisted. In the Pacific, no airborne operation involved the use of airborne units larger than a regimental combat team. The operation which most nearly fitted the concept of a special task force, on a larger scale, was the invasion of Southern France when the First Airborne Task Force was organized from a

number of separate units. That force functioned well, but it faced problems of co-ordination greater than those which an airborne division usually encountered.

Again, officers studying the problem for the Army Ground Forces recommended that the airborne division be retained. Suggesting that experience had shown only a limited need for small airborne units, such as in the taking of Corregidor, and pointing to the experience of the Marine Corps in organizing small parachute units (which were disbanded without ever being used), the Army Ground Forces concluded that task forces should be organized from airborne divisions for small-scale operations. Moreover, separate units were considered administrative "orphans" which added unnecessary problems to the airborne organization.

A special problem of organization was that of the glider pilots, and it received the repeated attention of airborne commanders. The commanders of the 82d and 101st Airborne Divisions recommended, after the Holland operation, that glider pilots be assigned to the airborne divisions. British practice was to organize glider pilots as ground troops, but the Americans left them to the air forces. If air training were more important for glider pilots than ground action, perhaps there was merit in making their training and their control a responsibility of the air forces. If their ground combat role were considered essential, perhaps it would have been well to assign them to the airborne divisions.

Over-all control of the airborne program was the subject of some rivalry from its inception. The Chief of Infantry, the Chief of Engineers, and the Chief of the Air Corps each could find compelling reasons why his branch should control the new development. The Infantry won the assignment, but soon it was apparent that other branches were going to be involved, including the Air Corps which

would have to furnish the air transport. The reorganization of the War Department, in 1942, brought the program under the control of the Army Ground Forces. Recognizing the need for a co-ordinating and directing agency, the Army Ground Forces then set up the Airborne Command to perform those functions. The Army Air Forces, for its part, organized a Troop Carrier Command to co-operate with the Airborne Command in airborne training. Over-all direction remained in the hands of the War Department.

Culmination of the organization at the top level—at a level which would bring under a single command both airborne and troop carrier units—was the activation, in Europe, of the First Allied Airborne Army in August 1944. Originally conceived so as to bring various Allied units under a unified command, the inclusion of both troop carrier and airborne units made possible the type of co-ordination in planning and execution never before achieved.

As the War drew to a close, there were suggestions that that kind of organization should be set up within the United States. Some proposed that an Airborne Command be organized which would include troop carrier and airborne units. Others suggested the creation of an independent Airborne Force. Some air force officers, for example, General Arnold and General Brereton, thought that airborne divisions should be made a part of the air forces. On the other hand, some ground force officers were raising the possibility of including the Troop Carrier Command in the ground forces.

The concept of bringing together airborne and troop carrier forces under an airborne army in the European Theater won almost universal approval, but no similar organization ever was effected to supervise airborne and troop carrier training activities within the United States. In his reply to the War Depart-

ment questionnaire on the postwar military establishment, General Devers, then Commanding General, Army Ground Forces, agreed that, in wartime, a unified command should be established under the theater commander for airborne operations, but "for peacetime training and operations, the Airborne forces should remain under Army Ground Forces control and the Troop Carrier Command under Army Air Forces control."

If unity of command were a sound principle in a theater of operations, it should also be a sound principle in the Zone of Interior. The position of Supreme Headquarters in Europe was analogous to that of the War Department in the United States. Supreme Headquarters found it useful to have an airborne army to exercise control over both airborne and troop carrier units. The War Department might have found such an agency equally useful. At the same time, all the shortcomings of War Department co-ordination could not have been overcome merely by the addition of another headquarters. Too much depended upon policy decisions and strategic planning which were functions of the War Department General Staff.

Inconsistencies in organization and control escape definitive explanation, but certain tendencies can be suggested. Any broad, historical generalization is likely to be questioned on the ground of offering too simple an explanation for complex situations. But running like a thread through the many developments affecting the organization and control of the airborne effort is a tendency which, undoubtedly, governs much in human affairs. Often alluded to but seldom spelled out, it probably goes further to explain the proposals and reactions on organization and control than all the studies ever made, all the boards which ever met, or all the experiences ever acquired. It is simply the propensity in men to seek importance.

Would the proposal add responsibilities and personnel? Then this headquarters

concurs with enthusiasm. Would the proposal curtail activities and personnel? Then this headquarters does not concur, and it marshals impressive data to prove the essentiality of its functions: It seems almost a characteristic of human nature for a person to attach exaggerated importance to things with which he is associated, whether it be his home town, his club, his school, or his branch of military service. Thus identified with something important, he builds a secure feeling of self-importance.

Even those most anxious to be open-minded are likely to favor policies which would result in the greatest enhancement of their own branches or their own organizations. This is not to imply that all suggestions are made selfishly, nor even that those which are so made are necessarily wrong. To some extent, there must be a narrowness of viewpoint in all men, depending upon limitations in experience as well as in understanding. It is to be expected that an experienced airman will think, primarily, in terms of how air power can best contribute to the war effort, or that an infantryman may see only the indispensability of the infantry. The impartial, fair-minded man who is unaffected personally by a series of proposals and counterproposals may demand something of a compromise. While compromise, as such, appeals to a sense of fair play and to the desirability of escaping controversy, it does not necessarily make for the best solution. Indeed, compromise in military affairs may be the worst possible course.

A quest for importance, then, seems to loom in the background of many developments in the organization and control of airborne forces, as well as the merits of the case being considered. Infantrymen, engineers, and airmen could see reasons for control of parachute troops by their own branch, but few officers proposed that the program be assigned to some branch other than their own. Officers associated with the Airborne Command applauded its

growth, but they were strongly opposed to its reduction to an Airborne Center, and to the transfer of the Parachute School to the Replacement and School Command.

When the question of a unified airborne command arose in Europe, officers of the Allied Expeditionary Air Force supported the move enthusiastically until they found that it was planned to transfer control of troop carrier aviation from the Allied Expeditionary Air Force to the new headquarters. The Ninth Air Force likewise agreed that troop carrier and airborne units should be brought under unified command, but it went further: supporting tactical aviation also should be included—all under command of the Ninth Air Force. The 1st United States Army Group agreed that a higher airborne headquarters was necessary, but felt that it should be limited to the organization of a United States Airborne Corps—which would remain under the control of the 1st United States Army Group.

Similar reactions greeted proposals for setting up a comparable organization for the postwar establishment in the United States. A number of ground force officers proposed that troop carrier aviation be made organic to the ground forces. Several air force officers recommended that airborne troops be made organic to the air forces. Practically in no case did an air force officer propose ground force control, or vice versa. Proposals for a separate airborne army or an airborne force directly under the War Department won the approval of some, but Army Ground Forces opposed any move which would take the airborne troops from its control, and the Army Air Forces opposed any move which would take troop carrier aviation from its jurisdiction. The result was a compromise and a continuation of the general structure used, during World War II, in the continental United States.

Appeals for enlargement followed the

setting up of almost every new organization, from parachute brigades to airborne divisions, and from the Airborne Command to the First Allied Airborne Army. Those appeals, undoubtedly, were due, in part, to real inadequacies of organization, but one cannot escape the belief that they were also due, in part, to the quest for importance on the part of the persons immediately concerned. Indeed, some of the organizational shortcomings may have been due to General McNair's recognition of that tendency. In 1943, the commander of the Army Ground Forces had written:

I know of no instance where a commander has recommended a reduction of the means at his disposal—either personnel or material—and of few cases where a commander was satisfied with what he had. Invariably commanders seek more and tend always to make their unit self-contained. It was such proclivities that brought about the present wasteful and unwieldy organization. Commanders do not consider the large picture.

Matters of Policy

It is arguable that hostilities, in World War II, might have been concluded much sooner had they been conducted with any of several different kinds of emphasis. Military victory might have been obtained more quickly by:

1. Reducing the airborne effort and diverting its equipment, men, and supplies to the supplying of ground armies by air.

2. Curtailing the production and operation of all troop carrier aircraft to make even more abundant resources available to the bomber offensive.

At the same time, it also may be true that total results would have been much better:

1. If commitments of troop carrier aircraft to the delivery of supplies to ground armies had been reduced in favor of greater emphasis on the airborne effort.

2. If, in view of the disappointing re-

sults of strategic bombing, the heavy bomber program had been cut to make available resources for enough transport aircraft to provide adequately for both a larger airborne effort and supply by air to ground armies.

Such questions defy conclusive answers, but they need to be considered in any evaluation of the conduct of the War.

Whatever the relative merits of various ways of warfare, the means chosen depend upon high policy decisions and the basic assumptions of war leaders. American conduct of World War II apparently was based on the notion that a more or less "balanced force," which recognized several essential means of combat, was desirable. Airborne warfare was made a significant part of that over-all program. But inconsistencies in implementation appeared almost at once.

Unless a nation maintains almost permanent mobilization, shortages of equipment are bound to result from the rapid expansion of armed forces to meet a new emergency. This was especially true of the United States Army in the early 1940s, and such shortages were bound to be even more evident in new programs, like the airborne, which required such special equipment as airplanes, gliders, and parachutes. At a time when mortars and antitank guns were in short supply, it could not be expected that aircraft and parachutes would be abundant. Moreover, an important time lag had to be taken into account between orders and deliveries, and few leaders were thinking seriously in terms of a major airborne program 2 or 3 years ahead of its inauguration. Some of the early shortages which handicapped the airborne program, then, could have been expected.

More serious was the chronic persistence of shortages of troop carrier aircraft. In warfare, there is seldom any such thing as "enough" of anything. When

priorities are established on the basis that agencies in third or fourth priority will receive their share only after those in first and second priorities have been satisfied, those in the less-favored categories may find little or none of the materials left for them. If it has been determined that certain activities are to play essential parts in the war effort, then the more reasonable course would be to ensure to each of those activities the percentage of the equipment or personnel, in question, which it must have early enough to carry out the assignments planned for it.

Some of the difficulty of co-ordinating troop carrier and airborne requirements was due to the lack of precision in long-range strategic planning. Some of it was the result of poor co-ordination between G3 and the Operations Division within the War Department General Staff itself. Some of it grew out of a lack of co-ordination between the Army Ground Forces and the Army Air Forces, as well as the lack of enthusiasm for the new effort within those headquarters. Some of it arose from diverting troop carrier aircraft to other missions.

What might have appeared to be a satisfactory ratio in the activation of troop carrier and airborne units had little meaning, in practice, when troop carrier units were sent to theaters where no airborne troops were even present. Surely it was an expensive and wasteful practice to send units, specially trained for formation flying and airborne operations, to haul cargo in Alaska, Panama, the Middle East, and the South Pacific where no airborne operations were even contemplated. The primary, not the secondary, mission of troop carrier squadrons throughout the Pacific Ocean areas was to haul cargo—to act as tenders for striking air units. A more candid and a less costly policy would have been for the

air forces to have activated enough air cargo squadrons for their own needs—even at the expense of troop carrier activations which never were used for their primary missions.

Troop carriers were diverted to similar activities in the Mediterranean and European Theaters, but there a more pressing demand for such services existed: that of supplying ground armies by air. Again, it was a matter for major policy decisions as to whether troop carrier aircraft should be used mainly for supply by air or for preparing and carrying out airborne operations. In Europe, the decision usually was in favor of missions entailing supply by air.

The dogma of the "inherent flexibility" of air power was something of a handicap to the airborne effort in two ways:

1. Troop carrier units were shifted to tasks for which they were not intended and away from airborne participation.
2. Airborne forces never had, in any numbers, aircraft designed specially for airborne operations.

As long as the Army Air Forces were committed to a policy of "proving" the decisive capabilities of strategic bombing, attention to troop carrier needs could not have been more than a secondary consideration. General Arnold, true enough, was an airborne enthusiast. But he was more of a strategic bombardment advocate. In his study of recommendations for the postwar establishment, Colonel J. J. Ewell (who had commanded a regiment in the 101st Airborne Division) noted:

Troop carrier and airborne [units] are inseparable. Each has many other commitments but in the actual combat operation they must co-operate perfectly. The relatively slow growth of our airborne potentialities in this War has been primarily due to Air Force indifference to troop carrier needs.

Whether the holding of sizeable troop carrier units out of other activities, to

be used only for preparing and training for airborne operations, actually would have been a violation of the principle of economy of force depends, somewhat, on the point of view. Such a policy might have had the appearance of inaction as far as combat was concerned. On the other hand, it might have been just as effective as a policy which massed impressive totals in bomber sorties, hours flown, and tonnage of bombs dropped but which, though carrying the appearance of violent activity, had relatively little effect on the enemy's war-making capacity until the last months of the War. In addition to contributing a consequential strategic threat, a policy of holding out troop carriers might have permitted the attainment of that perfection in airborne training and technique which would have rendered airborne operations considerably more effective in breaking the enemy's will to resist; more so, perhaps, than were many heavy bomber missions.

Policies affecting the troops and their morale grew out of the assumptions adopted for the airborne program. Differences in pay, initially, between parachute troops and glider troops could have resulted only from overlooking the obvious implications for morale and *esprit de corps*. The low priority of the Troop Carrier Command in the Army Air Forces led to discrimination against it, in the assignment of pilots and communications men, and in the withholding of such equipment as self-sealing gasoline tanks for troop carrier aircraft. To fly heavily armed and armored bombers at 300 miles an hour to drop bombs from an altitude of 20,000 feet—that was combat; but to fly an unarmed and unarmored transport at 110 miles an hour to drop men into a battle zone from an altitude of 500 feet—that was not considered combat. Further morale problems for troop carrier units arose from the idleness of glider

pilots caught in training bottlenecks or shipped to the Pacific with no glider missions to fly.

A considerable part of the misfortunes of airborne operations in North Africa, Sicily, and Normandy can be attributed to faulty training. In some cases, training in the United States may have been adequate, but its effects were lost when the troop carrier units were assigned to cargo-hauling missions for long periods of time. In other cases, shortages of aircraft and lack of co-ordination in the United States resulted in unsatisfactorily trained units being sent overseas. General McNair was more interested in seeing airborne divisions trained well for ground combat than in perfecting certain techniques peculiar to airborne operations at the expense of such training, and he had noted a tendency of "trick outfits to over-emphasize their tricks." But General Ridgway's comments on the Sicilian operation pointed to deficiencies of the 82d Airborne Division in *airborne training*.

The most important problems of individual training for airborne troops were those concerned with parachute training. All men assigned, initially, to parachute units received their basic parachute training at the Parachute School. In addition, the Parachute School trained all paratroop replacements in the Zone of Interior. In the theaters, however, airborne divisions or training centers set up their own parachute schools in order to qualify certain key personnel as parachutists, and to overcome shortages in replacements being received from the Parachute School.

Conclusion

The airborne effort was an expensive undertaking. Whether its cost was justified depends upon the importance attached to the results obtained, in com-

parison with the cost and results of such other programs as the strategic bombing offensive or the development of the armored divisions. The initial cost of equipping an airborne division was about the same as that for equipping the much larger infantry division. Added to its cost, then, were the airplanes and gliders required, the extra resources and time for training, and the extra shipping space needed for overseas movement of airborne and troop carrier units. It took 3 months to train an airborne division after it had completed ground training, and it took 5 months, two of which had to be completed before joint training could begin, to train a troop carrier group. Needs for paratroop replacements imposed additional costly burdens on resources for their training. Whether or not the effect of airborne troops in specific operations, and their effect on enemy dispositions, as a force-in-being, was worth that cost is a matter of judgment. In any case, the airborne effort entailed the use of important resources and it left a mark on World War II which cannot be ignored.

Memory usually is kind in dimming some of our more unpleasant recollections and experiences. Unattractive accompaniments of war have a way of fading, with the benefit of time and distance, into obscurity. Airborne warfare thus becomes only the sheer beauty of graceful airliners gliding through the thin clouds of a still, moonlit night, or the glamour of hundreds of silken canopies drifting earthward from sunny, blue skies. But in the mind of a veteran trooper, the sound of roaring engines, the order to "stand up and hook up," the cry of "Geronimo" or "Bill Lee," or the feel of prop blast would set to racing, through his consciousness, deep-seated fears of jumping into the unknown, of facing heavy flak,

and of the depressing confusion of scattered drops in a strange and hostile country. And he would know that plans for the future must take into consideration those fears and shortcomings as well as the

spectacle and the achievement. That is his charge to the men responsible for strategic planning, and for the development of airborne doctrine, organization, and policies.

In my opinion, we have only begun to exploit the possibilities of applying air transportation to the Army. Given transports in sufficient quantity, our divisions could assume greater strategic importance for distant areas threatened in the world or in the far-flung operations of a global war. With the necessary gliders and other specialized equipment, our airborne divisions could go over enemy lines to strike vital targets which otherwise could only be taken at great loss in men and equipment.

General J. Lawton Collins

RRR

THE NEW RANGER COMPANY

ARMY ranger companies are now being organized as integral units of infantry divisions. These hard-hitting and highly mobile units will be available to division commanders for special missions of the types performed by their predecessors. Ranger companies will be composed entirely of volunteers, and the men will be selected for the first units on the basis of high mental and physical standards. All will be qualified as parachutists. Training will emphasize the use of foreign weapons and maps, demolitions and sabotage, guerrilla warfare, amphibious and airborne operations, and close combat.

The ranger company, with a strength of 5 officers and 110 enlisted men, will include three platoons with three 10-man squads in each platoon. Every ranger will be equipped with a light automatic rifle and each squad will have either a 60-mm mortar or a bazooka. Each man will carry two rounds for these weapons, in addition to his rifle ammunition and certain demolition equipment. For the most part, the rangers will travel on foot and few vehicles will be used. The men will be conditioned to march long distances rapidly, day or night.

The Ranger Training Center at Fort Benning, Georgia, has been set up to de-

velop and test the organization, equipment, doctrine, tactics, and techniques, and conduct the training of these units. All volunteers for the rangers initially will receive 6 weeks of intensive training which will be concluded with a continuous 48-hour maneuver.

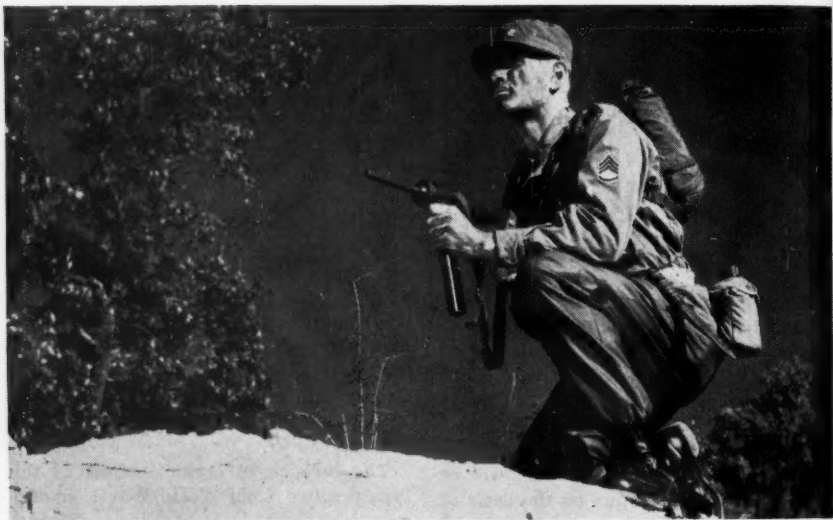
The decision to organize units of this type resulted from World War II experience accentuated by combat lessons learned in the fighting in Korea, where enemy forces made highly successful use of small groups which were trained, armed, and equipped for the specific purpose of infiltrating United Nations lines.

The Army employed ranger units successfully, during World War II, in North Africa, Sicily, Italy, Europe, New Guinea, and the Philippines. However, the rangers then were organized into separate battalions, and were not integral units of divisions.

Members of ranger companies now being organized will be authorized to wear the distinctive ranger shoulder insignia, and otherwise will continue the traditions of World War II outfits.

The following photographs, recently released by the Department of Defense, illustrate certain aspects in the training of these specialized units.

An indication of the Army's constant desire to improve its organizations is the inclusion of a ranger company in each infantry division. Well-trained, they are capable of emulating the feats of their predecessors



The training of all rangers is conducted under simulated combat conditions and with live ammunition. Approximately 50 percent of the training is done at night. Above, a ranger trainee with camouflage make-up on his face prepared for action. Below, two of the trainees practicing rapid fire techniques while advancing toward an objective.





All volunteers for the new ranger companies are qualified as parachutists and required to make several practice jumps during their training. Above, a group of ranger trainees completing a training jump at the Ranger Training Center. Below, a veteran ranger of World War II instructing a group of trainees in how to disarm a potential aggressor.





Personnel for the new ranger companies are selected on the basis of their high mental and physical qualifications, and their training is geared to achieve maximum efficiency. Above, trainees negotiating a high wire in preparation for future river crossing operations. Below, rangers preparing themselves for future amphibious-type operations.





Every ranger must be thoroughly versed in the use of all types of equipment. Above, a trainee firing a flame thrower at a pillbox. Below left, a ranger making use of camouflage and concealment—an important aspect of ranger training. Below right, a trainee sewing the distinctive ranger insignia on his uniform prior to graduation.



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Logistical Organization for an Overseas Theater

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The views expressed in this article are the author's and are not necessarily those of the Department of the Army, the Army War College, or the Command and General Staff College.
—The Editor.

THE supply and maintenance of men and matériel are functions that concern all commanders. Just as every commander desires to control the administrative and logistical activities of his command, so each separate department—the Army, Navy, and Air Force—desires to be completely self-sufficient, administratively and logistically.

It appears that the Joint Chiefs of Staff realized that the heavy requirements of modern warfare made complete logistical independence of each department impossible. Hence, the Joint Basic Logistical Plan, issued in 1943, stated: "Wherever possible, supply items or services common to both the Army and Navy (will be provided) by a single agency." The logistical independence of the armed forces continued to decrease throughout World War II. Duplications of many logistical services were eliminated and studies were initiated on the joint use of facilities and services.

The National Security Act of 1947 set the pattern for joint logistical operations as we know them today. Among the more apparent actions taken by the Department of Defense were the establishment of the

Military Air Transport Service and the Military Sea Transportation Service.

In the first case, the Military Air Transport Service operates under direction of the Chief of Staff, United States Air Force, but uses personnel from both the Air Force and the Navy. In the second example, a single department, the Navy, is responsible for providing a common service for all the departments. Recently, the Secretary of Defense directed the creation of the Central Military Land Traffic Office, under the Chief of Transportation, Department of the Army, to provide traffic management of land transportation for all three of the armed forces. Activities of the office of the Director of Medical Services, Department of Defense, concerning the interim joint usage of existing military hospitals and medical personnel is a further example of the trend toward the integration of the logistical support provided the armed forces.

From the foregoing, it can be seen that a considerable amount of co-ordination and unified direction of logistical activities is being accomplished at the national level. But what of the unified commands, that is, our overseas theaters, in event of another war? How will the logistical operations supporting the component forces of a unified command be controlled and co-ordinated?

It has long been recognized that unified commanders (theater commanders) must control the strategic and tactical opera-

tions of the forces assigned to them. However, the extent to which they could exercise administrative and logistical control over these forces has been limited by the unilateral laws and regulations under which the Army, Navy, and Air Force components must operate. Because of the fine line between operational control and administrative control, the Joint Chiefs of Staff have found it necessary to give the unified commanders some degree of administrative control over the component forces assigned to them. As a result, current doctrine states that unified commanders will co-ordinate the logistical and administrative support of their component forces, and that the component commanders will conduct the actual administrative and logistical operations in accordance with the laws and regulations currently effective within their respective departments.

The soldier, sailor, and airman is fed, clothed, and equipped largely from the Zone of Interior. Many of these items of supply and equipment are common to all the component forces within the theater. After delivery to the theater, these items must be given proper distribution. To accomplish this distribution, several services and facilities common to the three component forces are required. The logistic support of an overseas theater is a complicated and never-ending task of the greatest importance to the success of combat operations. This complex aspect of

which theater logistical operations can be accomplished. One is to establish a joint logistical agency to provide all the services and supplies required by the theater components. The second method is to assign to one of the component forces the responsibility for providing a service or item common to all components.

The organization of the theater headquarters is relatively unaffected by the type of logistical support organization established within the theater. The unified commander must ensure adequate representation of all the components on his staff. The theater G4 retains staff supervision over all theater logistical matters, issuing such directives and formulating such policies as are necessary to ensure the support of all forces in consonance with the theater mission and the desires of the unified commander.

The primary purpose of a theater logistical support organization is to relieve combat commanders of the responsibility for the performance of logistical tasks and the control of territories not affected immediately by the conduct of combat operations, to include:

1. Port operations.
2. Supply.
3. Transportation.
4. Medical service.
5. Construction.
6. Area control and defense.

The scope of these operations is the

Maximum use of facilities, resources, and manpower; a theater-wide stock control system; and centralized territorial responsibility are some of the advantages of a joint communications zone organization

warfare, coupled with the increasing requirement for economy in manpower and resources, points up the necessity for greater control of logistical operations by a theater commander than is presently the case.

There appear to be two methods by

predominant factor in determining the type of logistical support organization, joint or otherwise, to be established.

Port Operations

The simplest organization for the supply of a theater is that in which each

component force maintains its own supply system and, independently, places requisitions for its own needs on the Zone of Interior. The component having primary interest operates the water and aerial ports of debarkation and is responsible for receiving and forwarding supplies to the depot systems of the other components. This type of operation is principally mechanical and, in itself, is efficient. In addition, it has the advantage of placing supplies in the hands of the requisitioner at the earliest possible time. However, it is not flexible. There can be no changes in plan. All supplies have to be forwarded to the depots of the component concerned or placed in intransit storage. Also, the co-ordination of transportation requirements is difficult, and cross hauling and the uneconomical use of transportation results.

Ports of debarkation can be placed under a unified command using personnel and units from each of the component forces to perform the actual operations. This system provides more flexibility and facilitates identification and diversion of supplies required by changes in plans. Transportation requirements can be reduced. However, unless coupled with other forms of joint logistical support, it does little to correct the deficiencies of port operation by a single agency as discussed above, and it does not provide ready information, from a single headquarters to the theater staff, for planning purposes.

Supply

Supply action below the theater headquarters level includes the screening and reviewing of requisitions; and the receipt, identification, transportation, storage, and issue of supplies received from outside the theater and from local procurement. Any organization designed to consolidate supply functions within a theater, beyond the receiving and transit operations at ports of debarkation, is comparable with the

Army's concept of a communications zone organization in a theater of operations.

Carrying out the joint aspects of supply operations to the maximum envisages the common transportation, storage, and issue of items, to as great an extent as possible, without interfering with the tactical operations of combat commanders. Items common to all the components can be stored in depots located within the joint communications zone to enable direct issue to the combat forces of the Army, Navy, and Air Force. This system may or may not include the storage and issue of items peculiar to any one component force. Special sections of general depots or separate branch depots can be established to handle these special items. The degree to which such co-ordinated supply action can be carried out is limited only by the facilities available and the locations of the forces to be served. It is obvious that a single storage and distribution system will provide greater efficiency and economy, with resultant savings in manpower, as compared with the three parallel but separate systems operated respectively by the Army, Navy, and Air Force within a theater. There will be material savings in transportation and facilities and, in addition, levels of supplies stocked can be reduced, lessening the quantities of any item required to be in the pipe line extending from procurement source to depot.

While the advantages listed above are obvious, there are serious objections to its operation by the one component force having primary interest. For example, the other component forces in the theater may doubt that impartiality exists in the distribution of common items. Again, the component charged with operating the supply system may be required to do so without being reinforced with personnel from the other forces. In addition, until a common supply procedure is adopted, personnel of the component force operating the supply system will require special

training so as to cope with the supply requirements, procedures, and techniques in use by the other theater components.

A theater supply system which includes the necessary units of all three forces under a single, unified command, responsible directly to the theater commander, appears to overcome the objections just enumerated. There would be adequate representation from all the component forces. This provides the desired flexibility to the supply system, as well as the specialized personnel familiar with their own services' technical nomenclature and procedure. It places the responsibility for the operation of the supply system on a joint commander who, in turn, is answerable only to the theater commander, thus removing any doubt regarding impartiality of the operation. It contemplates that requirements for common items will be consolidated by the joint supply agency, and that requisitions for items peculiar to one component will be screened through this same agency. This system permits theater-wide stock control to prevent the accumulation of excesses, and permits the redistribution of items in short supply. Finally, it provides, from one source, the supply information required in theater-level planning.

Transportation

The control and operation of transportation within a theater is governed by the policies and directives of the Secretary of Defense and the Joint Chiefs of Staff. Theater transportation, then, follows the pattern established at the national level, with the Army component operating all land transportation, the Navy providing water transport, and the Air Force responsible for air transport. There remains the problem of co-ordination and control of these mediums of transportation. Since transportation is necessary to the placing of supplies in depots, the method for its control should be the same as that adopted for the operation of the theater supply

system. The advantages and disadvantages concerning the theater supply operation under a single service and under a unified logistical command apply equally to the control and operation of theater transportation.

Medical Service

Medical service, like transportation, is another example of a common service requiring at least some degree of joint operation. While the line of action at the national level has not yet been determined, it is apparent that the day of completely independent medical services for the Army, Navy, and Air Force is past. Joint procurement and common nomenclature already have been established, and military personnel may be hospitalized in an installation of any one of the component forces. Within a theater of operations, all medical service may be provided by the one component having primary interest in that theater, or it may be conducted as a joint service. Again, the method adopted for the control of the supply system will determine the organization used to control and co-ordinate theater medical activities.

Construction

The Army has its engineer construction groups, the Navy its construction battalions, and the Air Force its aviation engineer battalions. Each is required for the support of its own component within a theater of operations. However, these units all perform similar functions in the construction field. Since economy of manpower and resources dictates joint usage of common facilities—ports, airfields, transportation network, and utilities—construction units must be employed to complement each other in the execution of theater base development plans.

The centralized organization of construction troops, as part of a joint com-

munications zone, removes the possibility of favoritism to any one component, since the joint commander is responsible directly to the theater commander. In such an organization, a joint staff is available to work out the details of major construction projects, which would otherwise have to be done at theater level, because of the joint aspects of such projects and their effect upon the over-all theater mission. In addition, the responsiveness to the theater decisions and policies is increased, since the joint communications zone commander is a direct subordinate of the theater commander rather than being two or more levels removed in the chain of command.

Area Control and Defense

While the control and defense of areas not essential to the conduct of tactical operations is not, in itself, a logistical function, the areas concerned contain all the logistical installations necessary to support the fighting forces of the theater. Any weakness in the control and defense of the area adversely affects the theater logistical operations.

If the theater logistical support system is built around the assignment of responsibility for common items and services among the three components, then the commander of one of the component forces must be assigned the task of co-ordinating the actions of the other components in the defense and control of the area.

On the other hand, if a joint communications zone is established under a unified commander, then command of the entire area is vested in one individual, served by a joint staff, who is held responsible for the control and integrated defense of the area. Defense plans are executed, not by co-operation, but by unified command.

It is considered essential to place joint tactical operations, such as airborne or

amphibious landings, under a single commander because of the necessity of co-ordinating and integrating the actions of the Army, Navy, and Air Force in furtherance of the assigned mission. It follows that unified command is necessary to co-ordinate and control the actions of the three component forces in defense of the logistical support area so that the over-all theater logistical mission can be best accomplished.

Conclusion

From the foregoing, it appears that a theater communications zone organization, which includes all the necessary services and supply units of the Army, Navy, and Air Force under a single commander who, in turn, is responsible to the theater commander, is the most effective system that can be used for logistical support of a theater. Such a system makes maximum use of the available facilities, manpower, and resources in furtherance of the theater logistical mission. It permits theater-wide stock control to avoid the accumulation of excesses, permits the redistribution of items in short supply, and provides a single, readily available source of logistical information for theater-level planning.

A joint communications zone organization places responsibility for theater logistical support squarely on one individual who is immediately subordinate to the theater commander. It thus relieves the theater headquarters of any operational functions and reduces the number of agencies from which the theater staff must obtain logistical information for planning purposes.

Finally, it places territorial responsibility of the area, not included in the combat zone, upon a single, unified commander who can direct and co-ordinate the actions of all component forces assigned to him for the over-all defense of the theater logistical support area.

Exploitation — Key to Success

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EXPLOITATION is the follow-through of military action. Its purpose is to convert local success into large-scale or decisive successes. Exploitation is not a matter of improvisation when opportunity knocks. Since all elements of a command which *can* participate *should* participate, exploitation must be planned before the action starts. Only by such advance planning will the commander be assured of having at hand, at the decisive place and time, the means required for exploitation.

The means provided must be sufficient to allow for a maximum exploitation in the shortest possible time, since success, in this phase of an action, is in direct proportion to the speed of the operation.

Throughout an operation, the means provided for exploitation must be considered and jealously guarded against that premature commitment which will lower their efficiency for their intended role, and may cause failure of the exploitation plan.

When the opportunity for exploitation is created, there will be more avenues to exploit than forces available for the purpose. Here, the principle of the objective must be kept uppermost. Proper planning will ensure that exploitation

is directed toward final objectives rather than those which, however tempting, are purely local in character.

The opportunity to exploit may be created in a number of ways. In each of the examples portrayed here, it was created by attaining surprise through superior technical advancements.

The Problem

Early in World War I, trench warfare stabilized the fronts by giving the defender a margin of superiority over the attacker. Both sides attempted massed infantry attacks preceded by tremendous artillery preparations and, in every case, failed to achieve decisive results. It was necessary, therefore, to devise new weapons to bring the power of the attacker to a much higher level.

Both the Germans and the Allies solved the problem. The solutions were completely unrelated; each could have been decisive; neither was. An examination of these two solutions reveals facts which should be known to every military planner.

The German Solution

The German decision to use poison gas was based on their concept of the problems created by trench warfare. Their

Preplanning, surprise, the selection of adequate objectives, and the provision of sufficient means, which must be committed at the proper time and place, are factors found in a study of successful exploitations

tactics were to keep the enemy under cover by artillery fire until infantry could approach the enemy trenches. These tactics failed because the defending troops remained in dugouts until the artillery fires lifted to allow the attacking troops to close. In the interval between the lifting of artillery fire and the arrival of the attacking troops, the defenders were able to leave their dugouts and man the defenses. With the attackers caught in the open and the defenders in trenches, attacks generally were unsuccessful and costly.

Gas was used for the same purpose as artillery fires. The plan envisaged the defending troops being incapacitated, not only while the agent was present, as in the case of artillery fires, but for a sufficient period after the agent had left the area so that the attacking troops could overrun the defenses against only minor opposition.

It was this use of poison gas as a supporting weapon, for a limited infantry advance, which saved the day for the Allied armies at Ypres.

The First Gas Attack

Due to technical limitations, the Germans decided to use a cloud gas attack, with the wind as the agent of delivery. For this purpose, they needed a front on which winds were blowing from their own into the Allied lines. The area selected was the Ypres salient in Belgium. Aside from the predicted, favorable winds, the selected front had many other advantages.

When the fronts were stabilized, the Germans were perilously close to taking the channel ports upon which the British forces, on the Continent, were dependent. Any breach of the Allied defensive line which permitted large German forces to reach these channel ports could well have resulted in the withdrawal of British forces from the Continent, or their eventual defeat because of a lack of supplies.

The salient was defended by British troops on one side and by French Colonials on the other, thus having all the traditional weaknesses of boundaries between units, compounded by the fact that those units were of different nationalities. The point selected for the use of gas was close to the objective and the communications network easily would support the maneuver.

The decision to use gas had been made on the highest echelon. It would be reasonable to believe that preparations for the use of this new weapon would have included the means for the exploitation of the expected success. This is where proper planning might have changed the course of history. Success was expected, as indicated by the objectives assigned to the German units for the action. *But these were all local objectives.*

The attack was launched late in the afternoon on 22 April 1915 and was so successful that, within a few hours, a 6-kilometer gap existed in the Allied lines.

General Mordacq, French historical writer, describes the situation of the Allies at 1900, on 22 April, in these words:

Around this time, the situation on the front attacked by the Germans was as follows: The Allies had only a few men left to oppose the German troops on the 6-kilometer point of entry, so that there were two great gaps of 2 kilometers each in the front. Artillery was completely lacking at the point of the break-through. It was, accordingly, the favorable opportunity for the Germans to push forward and exploit their unhelped-for success; only open doors remained for them to run through. *Fortunately for the Allies, the Germans remained in place.*

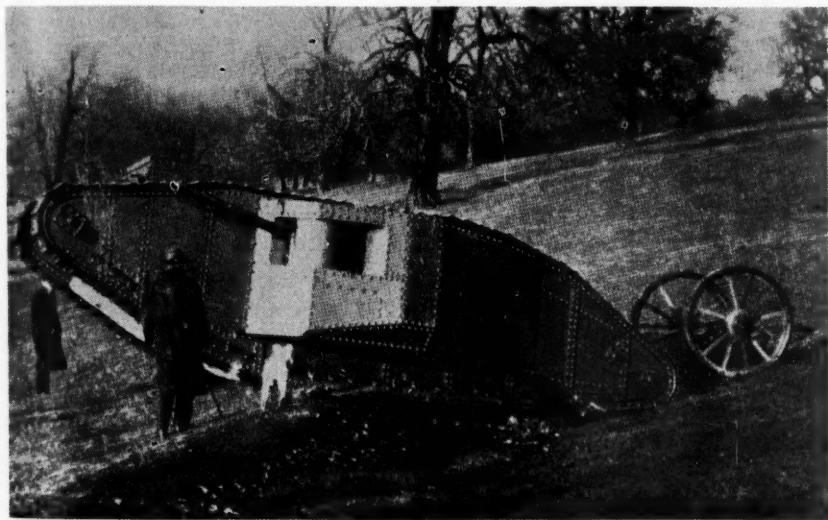
The German plan created an opportunity for exploitation. Because it did not provide the means for decisive exploitation, the success was purely local. Defensive measures against poison gas attacks were developed quickly. The only major break-through accomplished by the Germans, after the stabilization of the fronts, was not exploited.

The British Solution

The British approach to the problem of restoring the balance of power to the attacker was to bring the enemy trenches under fire by automatic weapons at close range. Since infantry could not advance the weapons over open terrain, the British method was to protect the weapon and

1916. Of greater interest are the "Notes on Employment of Tanks," written while the first tanks were under construction.

The use made by the Germans of machine guns and wire entanglements—a combination which has such power to check the advance of infantry—has, in reply, brought about the evolution of the "Cat-erpillar" bullet-proof climbing motor, or "Tank," a machine designed for the express purpose of assisting attacking infantry by crossing the de-



The original tank, developed by the British Army in 1915, was named *H.M.S. Centipede*. It was also called *Mother* and *Big Willie*, and finally designated as the *Mark I* tank.

its crew from small-arms fire until the protected weapon could engage the enemy infantry by firing, in enfilade, down the lengths of the trenches. This was the concept from which the tank was born.

After work had started on the original tanks, the decision was made to equip half of them with 6-pounder cannon, in addition to the machine guns originally planned.

The specifications called for a vehicle to carry at least 2 machine guns, to cross trenches 10 feet in width, and to climb vertical revetments at least 5 feet high. These specifications were met and the first models were ready for test early in

fenses, breaking through the obstacles, and of disposing of the machine guns. It is primarily a machine-gun destroyer, which can be employed as an auxiliary to an infantry assault.

Hostile machine guns, which it is impossible or inconvenient to crush, will be attacked by gunfire. It is specially for the purpose of dealing with these weapons, ensconced in houses and cellars, among ruins, in haystacks, or in other concealed positions behind the enemy's front line, where they may not be knocked out by our artillery, and whence they can stop our infantry advance, that the Tanks carry guns. Being covered with bullet-proof protection and, therefore, to a great extent immune from the hostile machine guns, they can approach sufficiently close to locate the latter, and pour in shell at point-blank range.

Though the assumption is that long-range fire will not be required for the above purpose, it may happen, owing to the speed of advance hoped to be rendered possible by the neutralization of the holding power of the enemy's machine-gun fire (which has, hitherto, been the most important factor in checking the momentum of our assaults) that

the Tanks, along with our infantry, will be able, soon after the start of the offensive, to get within range of the German artillery position. The 6-pounder guns, firing with reduced charges, will give accurate shooting up to a range of 2,000 yards, and they are being fitted with telescopic sights so that full advantage may be taken of a chance of this nature, should it occur.

Since the chance of success of an attack by Tanks lies almost entirely in its novelty and in the element of surprise, it is obvious that no repetition of it will have the same opportunity of succeeding as the first unexpected effort. It follows, therefore, that these machines *should not be used in dribbles* (for instance, as they may be produced), but that the fact of their existence should be kept as secret as possible until the whole are ready to be launched, together with the infantry assault, in one great combined operation.

The sector of front where the machines can best operate should be carefully chosen to comply with their limitations, i.e., their inability to cross canals, rivers, deep railway cuttings with steep sides, or woods and orchards. And this should be done as long as possible before the moment of attack, so that time may be allowed for the execution of the work on the lines of communication and in the shelled area behind the front line necessary to allow of the machines coming up to position without delay when required.

The exact distance apart at which the Tanks should move forward in the assault is a matter for experiment, but it is thought that in order to enable them thoroughly to search the ground for concealed machine guns, to support each other mutually by their own fire, and to sweep the German parapets sufficiently to permit of our infantry advancing more or less unscathed, they should not be more than 150 yards apart. It will serve to simplify present calculations if the interval be taken at a round figure of 100 yards. As regards the total frontage taken up, the number of Tanks under construction at present is 100; but since it is not safe to assume that more than 90 percent of the whole number available will be in line (to allow for the machines told off to work outwards and to work laterally for destroying wire), the front of attack that number will be 9,000 yards, or 5 miles. For the sake of discussion, this distance will be assumed in considering an operation undertaken by the whole of the machines available, the reduction of front where a lesser number is used being pro rata.

The extent to which the attack is pressed, i.e., whether it is to be a step-by-step operation in which, after artillery preparation, a strictly limited advance is made over the front concerned and the gain of ground consolidated, and then, after the necessary pause to give time for a renewed artillery preparation of the enemy's new front line a further limited advance is made, and so on; or whether a violent effort is to be made to burst right through the enemy's defensive zone in one great rush, depends on the decision of the Commander in Chief and the strategic needs of the situation. But, so far as is known, a *step-by-step advance*—which has the drawback of giving the enemy time to reinforce the sector threatened—is *not a course recommended* for any positive advantages which it possesses. It is a course which has been forced on us by the inability, with the means hitherto at our disposal, of infantry, even after immense sacrifice of life, to force their way through successive lines of defense guarded by

machine guns and wire, of which none but the first can be thoroughly battered by our artillery.

The frontage of an attack by 100 Tanks would, as has been explained, extend to some 5 miles, so that the question of the control will have to be worked out with some care. It seems, as the Tanks are an auxiliary to the infantry, that they must be counted as infantry and, in operation, be under the same command.

The First Tank Attack

All of these ideas were agreed upon by higher authorities, but one in particular was not carried out. On 15 September 1916, during the Allied Somme offensive, tanks were committed to action. Only 32 tanks were available for this effort. A carefully kept secret had been exploited in such a manner as to achieve purely local objectives. As predicted by the "Notes" quoted above, countermeasures soon reduced the efficiency of the tank until it became just another powerful tool of modern warfare instead of the decisive weapon envisaged by its creators.

After the War, senior German commanders stated that, if the tanks had been used in a mass of 1,000 instead of 32, the German line would have collapsed. The initial use of a new weapon, the only time when exploitation could have produced decisive results, had been devoted to what amounted to "a test under field conditions."

Lessons Learned

The course of history might have been far different if the use of either of these two weapons had been exploited fully. At the time when poison gas was introduced, the German Army had available large forces along the Western front. None of these were in position to exploit the success of the new weapon. The German High Command had one chance to win the War by a decisive break-through. When the break-through occurred, the planning had provided for no follow-through. No improvisation was possible. Plans to use even a fraction of the man-

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power available would have turned the local success into one of decisive proportions. The plan was complete, in all respects, except for the exploitation.

When the British introduced tanks, the doctrine for their use, worked out in advance, was sound. The plan for their

One cannot think without emotion of a result which the enemy might have attained if, instead of a mere experiment, he had first brought together sufficient means to proceed with a great offensive. The mistake of our enemies was of the same sort as that committed by our Allies, the English, when they prematurely revealed the secret of their tanks, in that they made use of the first examples instead of waiting to have sufficient numbers in readiness for a crushing success.



A portion of the artificial harbor (*Mulberry "B"*) built at Arromanches, France, through which men, equipment, and supplies were brought ashore during the Normandy invasion.

use also was sound tactically. The one great weakness was the loss of surprise occasioned by their premature use. The period during which tanks could have been decisive was frittered away by using tanks in small numbers. When it was seen how effective they were in the reduction of defensive works, they existed in insufficient numbers to accomplish a breakthrough. By the time sufficient numbers were available, countermeasures had been developed. The opportunity for the exploitation of this new weapon died with the plan to use them in small numbers.

Colonel Paul Blach of the French Army, speaking of the initial use of gas and tanks, sums it up in this manner:

Having drawn conclusions as to the reasons for the failures and the results of those failures in the initial uses of gas and tanks, an example of the successful exploitation of a surprise, due to superior technical advancement, is in order.

The Problem

To defeat Germany in World War II, it was necessary to engage her land armies on the continent of Europe. Germany, with her allies, occupied all the land mass of Europe with three notable exceptions. These were Sweden, Switzerland, and the Iberian Peninsula. The first two offered no means of entry to the continental land mass due to their geographical location.

Spain controlled the Iberian Peninsula route of approach and remained neutral.

Planning for a landing in Europe, then, had to provide for the meeting of resistance from land armies at the water's edge.

The German Concept

German plans included the fortification for the coastal areas to slow up a landing attempt, and large mobile reserves which would eject an invader.

A major consideration, from the German point of view, was the denial of logistical support to the invading forces. To this end, they planned to hold all major ports, even when they were cut off from German support. As a final measure, these ports were to be destroyed if the capitulation of the defenders became necessary.

The German plan, therefore, envisaged an invading force, without sufficient logistical support, being forced back into the sea.

The Allied Solution

The Allied command also saw the problem of logistical support as a controlling factor in the invasion operations. Foreseeing the eventual destruction of major ports, the plan had to provide for logistical support without the use of, at best, the limited use of the usual port facilities.

Artificial harbors, using *mulberries*, were created which allowed supplies to land over beaches at a rate sufficient to support large-scale operations. This development ranks with the introduction of gas and tanks, to achieve surprise, in that

it made possible the initiation of a war of movement. Having achieved surprise, however, the similarity ends, for in this case, full exploitation was provided for in the initial planning.

The secret of the artificial harbor was kept until it was used in a major operation. The means were guarded jealously prior to the invasion. With the tremendous requirements for landing craft of all types in other areas of the world, sufficient shipping was assembled and kept in readiness, at ports of embarkation, until the invasion could be launched.

As the invasion gathered momentum, the logistical requirements increased manifold. Prior planning had provided the means to keep the attack rolling at such a speed that the enemy had little time to react.

The invasion of Europe had no limited objectives. It was planned for what it turned out to be; a war-winning move.

Conclusions

For the successful exploitation of an attack the following must apply:

1. It must be planned before the action starts.
2. It must be directed at final, not local, objectives.
3. Sufficient means must be provided to keep the operation moving at such a speed that the enemy cannot react, in time, to oppose it effectively.
4. The means provided for the exploitation must not be committed prematurely nor to other roles.

MOBILE DEFENSE

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Instructor, Command and General Staff College

IT HAS been stated frequently by some of our most eminent military leaders that any future war in which the United States may become involved will pattern itself around three basic phases. These are:

Phase I.—A strategic defense, by the Western Allies in all theaters, together with limited offensives to seize vital areas.

Phase II.—The stabilization of all fronts. Industrial and manpower mobilization of the Western Allies is near completion.

Phase III.—The assumption of the offensive to achieve a decision.

In assessing the relative importance of each of these phases of a future war as conceived by our military leaders, we find it difficult to reach a firm conclusion. However, simple logic will indicate that, unless we are successful in Phase I, the later phases will not occur or, at best, will be most difficult to execute.

Our predominant land action, during Phase I, will be of two types: retrograde movements, and a mobile or wide-front defense. This is dictated by the inferior numbers of the "forces in being" of the Western Allies. That we be successful in both types of action is of the utmost importance. Consider for a moment the continents of Europe and Asia. Can anyone doubt the importance, indeed, the *extreme*

necessity, of maintaining a foothold on the European continent in event of an attack by an aggressor? Or can anyone deny the strategic necessity of maintaining our major bases in the Far East?

Our existing military texts contain limited material on the technique of conducting a mobile defense. It is the purpose here to expand upon this material, and to examine some of the problems which may face the commander in a mobile defense.

General Approach

In order to provide a common line of departure, let us first reach a firm understanding of the meaning of a position defense and a mobile defense.

A position defense comprises a series of mutually supporting defensive strong points or areas. These defense areas are located so that there can be a mutual exchange of supporting fires between them. In "average" terrain (terrain found in Western Europe), it is considered that such mutual support can be obtained with a distance of about 500 yards between the strong points. An infantry battalion is considered capable of defending an area with a frontage of about 2,500 yards. It can be seen then that the division defense capability as regards frontage is dependent upon the distribution of forces and

Because of inadequate 'forces-in-being,' Phase I of any future war will find us, initially, on the defensive. To contain any aggressor, therefore, we must be familiar with the techniques of conducting a mobile defense

the nature of the terrain being defended. Normally, in a position-type defense, with a formation consisting of two regiments on the line and one in reserve, a division can defend an area with a frontage of approximately 10,000 yards.

Whenever the frontage to be covered is so great that effective mutual support between positions cannot be obtained while still retaining an adequate reserve, a mobile-type defense must be adopted. This is frequently referred to as a wide-front defense, or as "defensive-offensive action."

In this article, we will limit ourselves to an examination of the techniques of a mobile defense when a division has been given the mission of conducting a defense on a front of about 25,000 yards. We will visualize our area of operations to consist of average, "normal" terrain, not outstandingly strong or weak defensively. We will consider these problems through the eyes of the division commander, realizing that the problems which face higher commanders are similar in nature and can be dealt with in like fashion.

Principles Involved

The basic principles which apply to a position defense apply as well to a mobile defense. Modifications in application obviously are necessary and they must be made in light of the situation facing the commander. It is incumbent upon the commander, however, to adhere to these basic principles for to disregard them invites defeat.

Paragraph 600 of Field Manual 100-5, *Field Service Regulations—Operations*, lists the following as factors favoring a decision to defend on a wide front:

1. The defender has air superiority and adequate armor.
2. Reinforcements are expected or available.
3. The enemy is inferior in training, in material, and lacks armored units or mobility.
4. The terrain to the rear is unfavor-

able, does not offer a shortened front, or restricts maneuver room.

5. The frontage assigned is such that the local commander has no choice but to defend it thinly.

6. Strong natural obstacles, which aid the defense and restrict enemy movement, exist to the front.

It will be noted that these factors favor a mobile defense but are not necessarily essential to its success. Would it not be precarious to assume that the Western Allies will have air superiority during Phase I of a future war, or to assume that our most probable enemy will lack armor? All possible active and passive measures must be taken to lessen these disadvantages. They include such items as early warning; camouflage; dispersion; night movement and employment of reserves; the use of mines, obstacles, and chemical agents; and the creation of an antitank defense in depth.

From the foregoing considerations, the basic techniques employed in a mobile defense can be stated briefly. They involve the selection of the critical terrain features within the sector and the development of an adequate organization for the all-around defense of these terrain features, recognizing that mutually supporting fires between them must be sacrificed, to a large degree, with a consequent increased dependence upon successful counterattacks to maintain the position.

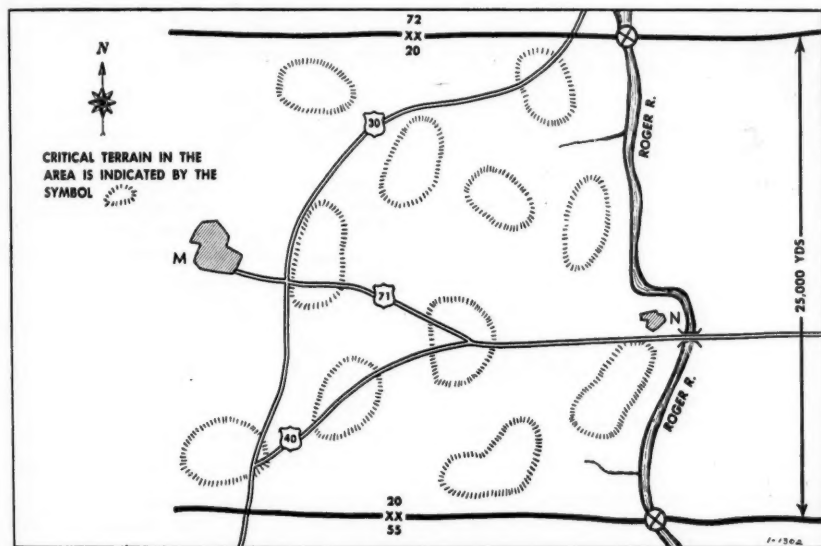
Selection of Position

The division, as part of a larger force, usually will have little leeway in the selection of the battle position. This will be dictated by higher headquarters. Within his assigned sector, however, the commander must study the terrain to select those critical terrain features which must be occupied. In broad terms, they are terrain features which are vital to our defense, and which, if seized by the attacker, will facilitate his advance through the position. Generally, they will include

areas that provide dominant observation and, occasionally, other localities such as communications centers which may have to be held.

The commander must further analyze the terrain to determine the positions to be prepared by the reserves, as well as

and all security measures commensurate with the situation must be exploited to provide for both distant and close-in security. In general, security forces are given more mobility and more fire power than in position defense. This is due, principally, to the frontage involved and



Sketch Map 1. This sector has been assigned to the 20th Infantry Division, which has been given the mission of conducting a defense on a wide front (mobile defense). The Roger River is fordable with difficulty. The 20th Infantry Division is not reinforced.

the location of the reserves. Throughout this analysis, he must bear in mind the critical need for observation and the location of obstacles in conjunction with fields of fire, cover, concealment, and likely avenues of hostile approach (especially for armor). The selection of routes for movement of friendly reserves also will be important.

Security

Security of the battle position assumes a greater importance in a mobile than in a position-type defense. An early warning of the enemy's approach is vital

the vital need for early warning. Tactical aviation provides the fastest means for obtaining information, and full use must be made of its speed and flexibility.

Distribution of Forces

In arriving at a proper distribution of forces, the commander must consider two conflicting factors:

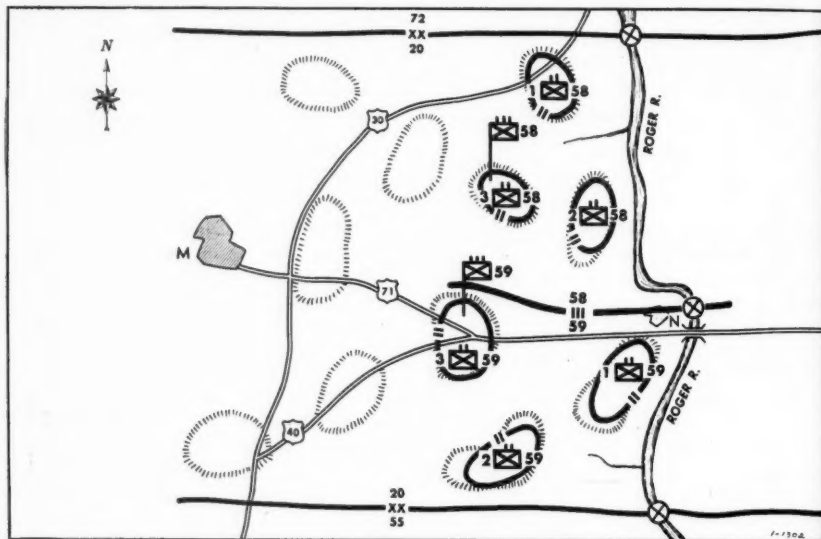
1. The necessity for sufficient forces to occupy and defend forward critical terrain features.
2. The necessity for the retention of

sufficient forces in reserve to eject an enemy penetration.

These factors demand a closer analysis.

A position-type defense is based chiefly

a calculated compromise between the forces required to eject an enemy penetration and those required to deny critical terrain features to the enemy. The former



Sketch Map 2. The Commanding General, 20th Infantry Division, estimates that he will require a division reserve of four infantry battalions and one tank battalion. At the same time, after a study of the terrain and other factors, he determines that two regiments must be employed in the forward portion of the battle position. To obtain the minimum reserve, he restricts the employment of the reserve battalion of the 59th Infantry (3d Battalion). This sketch indicates the disposition of the forward regiments.

Note that 50 percent of the 10 available combat (infantry and armor) battalions are kept in division reserve.

on mutually supporting positions and the counterattack.

The commander gives each of these considerations its proper weight in deciding upon the distribution of his forces. In a mobile-type defense, however, we find that mutual support is not present in the same degree as in a position defense. Additional emphasis, therefore, must be placed on the counterattack.

In the final analysis, then, a proper distribution of forces in a mobile defense is

is of prime importance, and the commander gives first priority to the strength and composition of his reserve throughout his analysis.

Another closely related consideration is the distribution of subordinate headquarters. The two principal factors which must be weighed are command and control facilities for those units in the forward portion of the battle position and a command headquarters for the reserve.

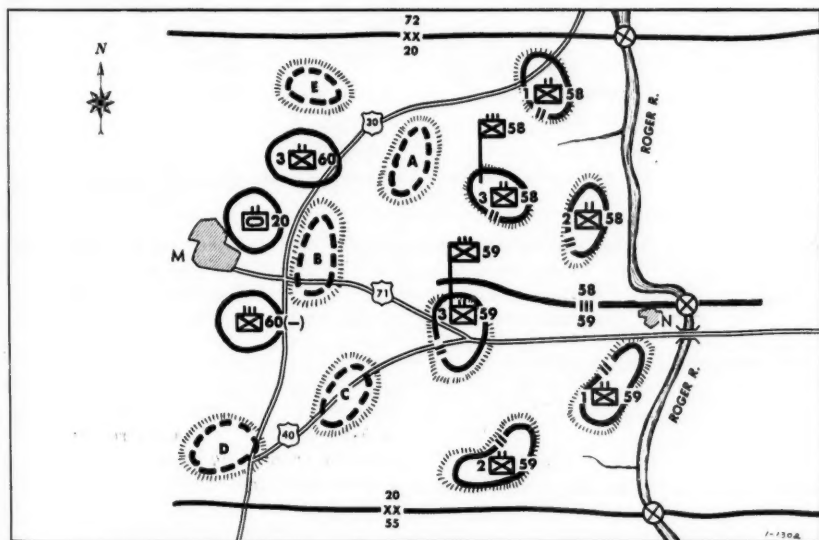
In some situations, it may be desirable

to assign to only one regimental headquarters the command of all the forward battalions, although the resulting burden on the communication facilities of that regiment must be considered. Such a situation, though unlikely, might exist if, despite the number of units required to occupy the forward portion of the battle position and the frontage involved, adequate control can be exercised by one regiment. The added advantages of maintaining a stronger reserve with two regimental headquarters to command these forces accrue to the commander under these circumstances. Usually, it will be necessary to place two regiments forward in light of the forces required to occupy

crease its strength by restricting the employment of the reserves of one or both of the front-line regiments, subject to division approval ("tying a string"), or by attaching elements of the forward regiments to the division reserve. Seldom will the commander employ three regiments forward, as this leaves him with insufficient reserves.

Defense of Critical Terrain Features

The defense of critical terrain features usually is based upon the capabilities and employment of the reinforced infantry battalion. Defense areas prepared by the forward infantry battalions may be con-



Sketch Map 3. Positions for the reserve are selected and prepared to protect the critical terrain and to provide a base for counterattacks. The division reserve is located so as to facilitate the implementation of future missions.

forward positions and the command difficulties inherent in a mobile defense. This may result in a weakened reserve. However, the commander may choose to in-

sidered as "bastions" of the defense. They are organized for all-around defense, provided with adequate supplies for prolonged action, must be prepared to fight in any

being assigned a wide sector, to attempt to cover completely its entire width. This, inevitably, results in a shallow defense. The serious consequences of such a decision are obvious. A sound axiom to follow is *the wider the front, the deeper the defense.*

In deciding where to locate prepared positions, the commander must:

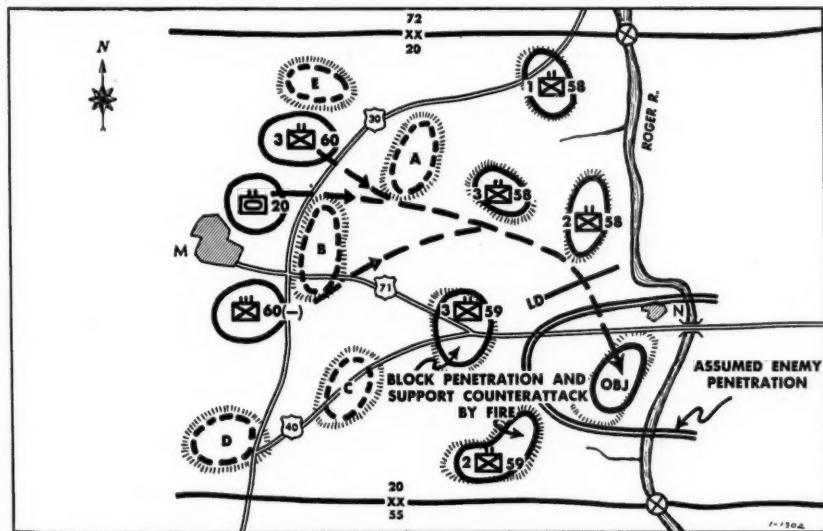
1. Retain critical terrain in the sector.
2. Limit or block possible hostile penetrations.
3. Provide a base for planned counterattacks.

It is desirable to have more prepared positions in a mobile defense than in a position defense. The importance of de-

of the means available, and then prepare the positions to the degree that time will allow, based on his established priority. Native labor may be exploited to assist in accomplishing this task.

Reserves

In paragraph 605 of Field Manual 100-5, we find: "The maximum number of troops are held mobile in each unit." The force that the commander holds in reserve depends, first, upon his estimate of the strength required to defeat an enemy penetration and, second, on the minimum forces required to defend the critical terrain features. The reserve must be highly mobile and it is desirable that it



Sketch Map 5. A partially completed counterattack plan to eject an assumed enemy penetration in the south of the division sector. Note the use of the reserve battalion of the 59th Infantry to blunt the enemy's attack and the maneuver undertaken by the remainder of the division reserve to strike the penetration on the flank.

termining the priority of preparation is, therefore, increased. The commander must weigh the relative merits of each position in light of his mission, make use

be strong in armor. Covered routes of approach to all critical points in the sector must be selected and reconnoitered as early as possible.

The reserve must be centrally located to facilitate the implementation of its future tasks.

Centrally located specifically refers to time—the time required to move to critical points in the sector. And, of course, time is influenced by the existing road net in the area. The future tasks of the reserve usually will be found in the counterattack; either as the counterattacking force, as the element providing a base of fire for another force, or in both roles. For example, some situations may require the entire reserve to perform a base-of-fire mission as a “blocking” force, while the reserve of the next higher headquarters (corps) executes the necessary maneuvers to reduce the enemy’s penetration.

Consideration also must be given to the possibility that an enemy penetration may successfully bypass previously prepared positions for, due to the wide area separating occupied prepared positions, they may be bypassed easily once an enemy penetration has been effected. This action will make it necessary for a part of the reserve to establish contact and block the penetration.

Prior to executing a counterattack, the momentum of the hostile attack must be stopped or at least slowed. In this respect, the commander must focus his attention on the “shoulders” of the penetration, and not on its “nose,” recognizing that the penetration can assume dangerous proportions if expansion in width is not blocked. A part of the reserve, therefore, may be required to move from its position, establish contact with the enemy, and block him while the bulk of the reserve executes the counterattack. Both the blocking and counterattacking forces must be mutually supporting, highly mobile, and strong in fire power. Armor and armored cavalry units are ideally suited to accomplish this task.

The commander often will find that,

due to time and space factors, he must place his reserve in two or more localities. The commander, in so doing, is not necessarily weakening his reserve. If accomplished wisely, this action may result in making the reserve more readily available to enter the battle at the decisive time and place.

Counterattack Plans

In a mobile defense, the vigorous and aggressive employment of reserves is essential. The key to a successful mobile defense is the ability to launch a successful counterattack. In a mobile defense, as in a position-type defense, counterattacks are launched to restore the battle position and cut off and destroy the enemy’s penetrating forces.

More counterattack plans normally must be prepared in a mobile defense than in a position defense, since the width of the sector and the lack of mutually supporting fires between defensive positions provide more opportunities for an enemy penetration. Plans must be prepared in the greatest possible detail to counter any penetrations; yet, flexibility must be retained in all plans so that adjustments may be made to fit the situation as it develops. Plans which visualize the employment of local (regimental) reserves as a base of fire also must be prepared, and adjacent divisions must co-ordinate their counterattack plans to provide for measures to counter possible penetrations along division boundaries.

The timing of the counterattack is, as always, a major consideration. In determining when to launch a counterattack, the commander must weigh these factors:

1. Has the momentum of the attack been stopped?
2. Is the penetration of such magnitude as to threaten the integrity of the battle position?
3. Can the position be restored during the remaining hours of daylight, or

must a night counterattack be undertaken?

4. Against the resistance expected, does the counterattack have a reasonable chance of success?

If the commander cannot answer all of the questions above in the affirmative, then he is justified in adopting one of two courses of action:

1. Delay his counterattack until a more propitious moment.
2. Occupy prepared positions with the reserve and request higher headquarters to execute a counterattack.

Due to the effect of the attacker's air activity on the mobility of the reserve, ample consideration must be given to night counterattacks and plans prepared accordingly. In this respect, night counterattacks require even more painstaking plans and rehearsals than do night attacks conducted when on the offensive. Counterattacking forces launching a night attack have one advantage; they are more familiar with the terrain over which the attack will be made.

Artillery

Artillery support assumes increased importance in the mobile defense. In its use, however, several problems present themselves. They are:

1. The difficulty of massing fires at critical points in the sector from primary positions.
2. The security of artillery positions.
3. The necessity for providing artillery fires well forward of the battle position.

The massing of artillery fires anywhere in the sector normally will be impossible from primary positions alone. Alternate positions must be selected carefully which will permit a concentration of fires in all critical areas.

Security is achieved by locating the artillery within organized infantry positions or by organizing separate defense areas with artillery units providing the

bulk of the forces for these positions.

To increase the depth of fires in advance of the battle position, the division artillery must be emplaced well forward. This involves exposure to destruction or early displacement in the event of minor enemy penetrations. Consideration, therefore, should be given to taking advantage of the greater range of corps artillery units which can provide the required fires with less danger of becoming involved in a penetration. This permits the light artillery of the division to occupy positions farther to the rear. It also has the added advantages of avoiding early displacement, covering the maximum area without shifting trails, providing depth in the artillery positions, and permitting maximum artillery support throughout the defense sector.

Partisans

Modern warfare has injected another consideration—partisans, both friendly and unfriendly—of which the field commander must be aware. It is commonly considered that friendly partisans are best employed to support an offensive. Their use, however, during defensive operations is also desirable and can provide significant benefits. Their activities will be principally covert in nature and may include the furnishing of information about the hostile forces and the terrain, the sabotage of enemy equipment, assistance in the organization of the position, and the like. The operations of friendly partisans usually will not be a responsibility of the division commander, but he must be familiar with the type of support which can be expected.

The presence of unfriendly partisans in rear areas during the strategic defensive phase of any future war, undoubtedly, will be widespread, and *this is* a problem of the division commander. It is a problem which must be recognized and for which plans must be made.

Certain measures to cope with unfriendly partisans will be prescribed by higher headquarters. These may include the arming and use of friendly partisans, regulations covering the treatment of violators and offenders, and restrictions on the civilian population.

Measures that may be initiated and employed by the division commander are:

1. Provisions for the collection of adequate and timely intelligence about unfriendly partisan organizations and activities.

2. Provision for local security for lines of communications, supply columns, and vital installations.

3. Provisions for the use of a mobile force to offset hostile partisan action.

4. Plans for the use of friendly partisans which may be assigned by higher headquarters.

No one plan for combating unfriendly partisans will be effective in all areas under all circumstances. Each situation must be considered in light of the attitude of the local population, the economic condition of the country, the nature of the terrain and vegetation, the extent of hostile underground organization, and the nature of hostile partisan activities. It is important, therefore, that the commanders concerned recognize the problem and that they take positive steps to meet and solve it.

Conclusion

It has not been the purpose of this article to develop new principles, but

rather to amplify and supplement the doctrine of mobile defense as contained in current military texts. Several points were emphasized. Among these were:

1. The principles of defense are applicable in the mobile-type defense, but their application requires modification due to the frontages involved.

2. Early warning of the enemy's approach is vital.

3. The critical terrain features in the sector must be selected intelligently and organized for all-around defense. The lack of mutual support between positions must be accepted.

4. Adequate reserves, strong in fire power and mobility, must be maintained.

5. A defense in depth is essential. The wider the front, the deeper must be the defensive position.

6. Penetrations of the battle position are to be expected. The attacker must be expelled by counterattacks executed vigorously.

7. Friendly partisans must be used whenever possible. Plans must include provisions for combating unfriendly partisans.

The very existence of the Western Allies may be dependent upon the successful application of the principles of conducting a mobile defense. It is incumbent upon us, the military, to become familiar with this application, and to be alert to the possibility of developing methods or techniques by which it may be improved.

Rear Area Security

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This article is a digest of a study entitled "Rear Area Security in Russia," prepared by the Office of the Chief of Military History, Department of the Army.

The publication of this digest does not constitute an endorsement of its views and recommendations by the Department of the Army, the Office of the Chief of Military History, the Army War College, or the Command and General Staff College.—The Editor.

AN ARMY planning a major campaign aimed at the heart of a country occupying a large land mass is faced with many problems. Not the least of these is the problem of security for long lines of communications and widely separated administrative installations in rear of the combat troops. This is particularly true if these lines of communications must extend deep into the homeland of the country being invaded and are, therefore, susceptible to attack by partisan forces.

This problem played a significant part in the plans developed by the German High Command prior to the invasion of Russia in June 1941.

Security Measures

Deliberations, over the type and extent of essential security measures which would have to be employed, led to the conclusion that some new approach to the problem must be found. Obviously, all supply routes would be considerably longer than those required for operations on the Western front. They would, thus, be more susceptible to incursions of all kinds. The limited rail and road net, extending through vast, sparsely settled areas in which there was an abundance of shelter and concealment for partisan bands, placed a new perspective on security needs. No longer was the only danger focused on the forward areas, as in previous campaigns. The operations zone of an army now appeared to be relatively much less exposed to partisan activities than the areas farther to the rear. Areas in close proximity to the front, while subject to limited attacks from within, would be the scene of strong concentrations of forces which would have a reasonably firm control over the local rail and road net and be in a position to keep the local population under close surveillance. Normal security measures would suffice. This was not true, however, in the vast expanse to the rear.

The problem of safeguarding lines of communications in the rear of the combat zone is ever increasing, due to improvements in partisan warfare. Its solution lies in the pacification of occupied enemy territory

The unusual extent of all prospective operations in the East prompted the German High Command to lay plans for the establishment of a security organization which would be more or less independent of the armies operating in the forward areas. For this reason, the area immediately to the rear of an army group operations zone was designated as an *army group rear area*.

Passive Defense

From the outset, a distinction was made between *active* and *passive* security measures. While special consideration was given to passive defense, the measures to be employed would not differ materially from normal procedures. Thorough training of all agencies and forces concerned with the moving and handling of supplies was recognized as a prerequisite. Supply conservation was emphasized. All troops received continuous instructions through appropriate directives and orders, and were further trained by means of demonstrations and field exercises. Plans were made for truck columns, moving over poor roads or through endangered areas, to proceed quickly and without interruption. Single vehicles were to avoid passing through partisan-infested areas. Full use was to be made of a block system, wherein strong positions were organized at intervals along a supply route. Convoys would move from one block to another, taking advantage of the security offered by these positions during periods when the partisans were unduly active.

Unloaded supplies of all classes would be placed underground insofar as possible. At night, or during air raid alerts, all railroad stations were to be cleared of trains carrying ammunition and fuel. If supply trains could not be unloaded promptly, they were to be separated and their individual sections distributed over all available spur tracks. Provision was

made to move central switchboards from railroad stations to points outside of towns, thus creating individual loop circuits around critical points. Supply trains would move at low speed (not over 10 miles per hour at night). Trains would move in convoy, with the locomotive placed in the center of the train in order to protect it from immediate destruction in case of mine explosions. Special mine-clearing devices, without crews, were to be placed in front of each train to set off enemy mines in the roadbed by subjecting the tracks to continuous vibrations. In some instances, an entire empty train would precede a full one carrying critical supplies.

Active Security

For the purpose of active security, special units of various types and strengths were created. At first, they were organized in the form of separate battalions, and only in those instances where unusually extensive installations had to be protected were several battalions combined under the control of a *security regiment headquarters*. Most of the personnel were taken from older age groups and consisted largely of veterans of World War I or of men who had received a minimum of training in replacement units. They were led by older reserve officers, or retired officers who had been recalled to active duty. These facts need to be emphasized for the better understanding of the difficulties which these units had to overcome later on in the performance of their tasks.

The units were equipped with a variety of weapons in altogether insufficient quantities. Later, when the German replacement system no longer was able to furnish an adequate supply of small arms, which were then more urgently needed at the front, the security units had to be equipped with captured Russian weapons.

The protection of forward supply dumps

involved a variety of problems. Internal security consisted of guarding the supply dumps, adjacent buildings, and facilities. These installations, however, soon grew to the size of small cities and required large numbers of security forces; for not only was it necessary to guard the stores, but the billets for the troops and the transport hauling the supplies also had to be protected. In addition, special protection had to be provided for all installations necessary for the maintenance and operation of the depots, such as power plants, railroad stations, and airfields.

The supply plan called for each newly installed central supply depot to organize a forward echelon, which was to move up behind the combat forces along the most suitable road. In addition to these forward echelon installations, other smaller supply depots were organized and located laterally in both directions.

In addition to the forces required for the tasks mentioned above, security troops were to be furnished to the several armies to protect their base supply depots and installations, and to relieve the combat troops, as soon as possible, of all rear area security duties. Experience had taught that the combat elements were burdened excessively with such duties and, therefore, were often deprived of forces which were urgently needed at the front.

German plans for active security called for an active air defense. Antiaircraft artillery units were to be provided for the protection of large or particularly important railroad stations, workshops, bridges, and similar installations. Fuel trains and similar shipments, which at a later stage of the campaign became unusually critical, were to be protected, wherever possible, by railroad antiaircraft batteries consisting of 20-mm four-barreled guns mounted on flatcars. These units were under the command of the army group rail transportation officer.

Troop transports and personnel on leave trains were responsible for their own security. For the protection of freight trains, cars were attached which offered observation and fields of fire over the entire length of the train.

The aircraft warning service of units in the area was hooked up with the railway signal communication system, so that all traffic control agencies could be alerted in time and with maximum speed. If the wire lines were destroyed, these warnings were to be transmitted by radio.

Russian Plans

As the plans and precautions listed above indicate, the German Army High Command was by no means caught unawares by the strong partisan activities encountered during the Russian campaign. It was known for some time that the Russians were determined to use organized partisan warfare in the defense of their Country, and that they had used propaganda to spread that idea among their population. Further proof was to be found in the "Russian Partisan Directive of 1933." Their future military leaders in partisan warfare had been carefully trained in the use of this method of combat. Just before the start of the campaign—according to information received in Germany—the Russian War Academy conducted war games in the area where certain locations were designated as so-called partisan centers.

Similarly, the Russian High Command had recognized at an early stage that, in contrast to the dense railroad and highway net of the highly urbanized West, with its ever present possibilities for alternate routes, the very few serviceable supply routes through the vast expanse of the Russian area were of paramount strategic importance. Furthermore, in view of the great distances, the poor condition of the highways (which deteriorated easily under the influence

of the weather), and the anticipated German shortage of motor fuel, the Russians realized that the railroads would be the principal medium for transporting supplies and that this would be equally true for all large-scale troop movements, furlough transportation, and evacuations. Clearly cognizant of this handicap, which would present itself in any military campaign against their Country, the Russians began, early in the War, to build up a "second front" behind the German lines.

Initial Activities

During the first 6 months of the Russian campaign, the German supply system generally functioned without major interruptions. Either the Russians had failed to recover from the initial blow or they were yet unable to muster the proper means for effective raids on German rear area communications. The local inhabitants generally were co-operative everywhere. They welcomed the German forces as their liberators and fervently desired nothing more than to resume their normal, peaceful activities. This attitude was demonstrated in many ways. It was a common occurrence for mayors to request German protection against scattered Russian soldiers who had formed bands in the deep forests and conducted raids against German troops and local inhabitants alike. These raids primarily were for the purpose of obtaining food, civilian clothing, and other necessities.

The German combat forces, at least during the initial period of the campaign, made every effort to restore normal conditions in the areas they occupied and to gain the confidence of the local population. A number of instances have been reported where combat divisions, held in an area for some time for one reason or another, were highly successful in the pacification of the area under their control. Every effort was made to return the economy

to some degree of normalcy. Collective work shops were abolished and, henceforth, every craftsman was permitted to practice his trade freely. The administration of state farms (*Sovkhoz*) was decentralized and they were turned into local agricultural co-operatives. All churches were reopened, and the German troops and local inhabitants met in common worship. The news spread rapidly throughout the area; and, from afar, Russian parents would bring their children to have them baptized in the newly opened church.

With the eastward advance of the combat troops, these areas were turned over to the rear area occupation authorities and the picture soon changed. The population was treated in a manner quite different from that to which it had become accustomed. Whereas, previously, certain regulations pertaining to the freedom of movement in the area or to curfew had been somewhat relaxed, they were now rigidly enforced. Every rule of common sense was suddenly replaced by strict adherence to the letter of the law. Minor infractions were punished to a degree of severity far in excess of that warranted by the act committed. The well-meaning elements among the population, who had demonstrated their willingness to co-operate fully, were now sadly disappointed, whereas their opponents rejoiced and hastened to exploit the new situation for the benefit of the partisans and their counterpropaganda.

By late fall of 1941, occasional acts of sabotage by groups and individuals had become routine. The beginnings of a well-planned partisan organization, which operated with a variety of technical and psychological means, were clearly noticeable. A typical Russian institution, based on national tradition, this organization grew steadily in size and importance throughout the entire War. With great skill, the Russian propagandists exploited

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every mistake made by the occupying power in the treatment of the local population. Whereas the local inhabitants, up to that time, had been friendly, trustful, and entirely willing to co-operate, their attitude changed greatly during the first winter.

The next step was the formation of small bands which established their hide-outs in the forests. They forced the inhabitants of the area to supply them with food and give support in other ways. They attacked small German camps or supply depots, raided and plundered single vehicles on the road, blew up Russian industrial enterprises that worked for the German troops, and took with them any Russians who were working for the occupying power.

Full-Scale Partisan Warfare

By 1942, Russian partisan warfare against the German rear area communications had entered a more advanced stage. A network of channels for transmitting orders and co-ordinating activities, thoroughly planned for in peacetime, reached from central headquarters in unoccupied Russian territory up to the western border of Russian and, in some regions, even into Polish territory.

There was a definite pattern to the activities of these units. While not confined solely to acts against the rail lines, the Russians knew that by destroying this means of transportation they could cause the invading armies the greatest hurt. An excerpt from the monthly report of the Chief of Transportation, Army Group Center, covering the period from 1 to 31 August 1943, contained the following information:

Despite the employment of special alert units for the protection of the railroad lines, partisan activity increased by 25 percent during August 1943 and reached a record of 1,392 incidents, as compared to 1,114 in July. The daily average amounted to 45 demolitions. In 364 cases, the rails were cut simultaneously in more than 10 places. Individual demolition points amounted to 20,505, while 4,528 mines were detected and removed. During the night from 2 to 3 August, the partisans

began to put into effect a program of large-scale destruction. Numerous demolitions were carried out which caused a serious curtailment of all railroad traffic and a considerable loss of railroad matériel. Within 2 nights, the six to seven thousand miles of track in the area were cut in 8,422 places, while another 2,478 mines were detected and removed prior to exploding.

During the night of 19-20 June 1944, the partisans carried out a major operation in the area of Army Group Center. This was 1 day prior to the Russian general offensive which eventually led to the collapse of the German Army Group. Altogether, the partisans made 15,000 demolition attempts on the railroad lines running through the area and were successful in 10,500 cases, all in the course of a single night. Their main effort was directed against the supply lines that served the Third Panzer Army, the same German unit which was to bear the brunt of the first heavy attack by the Red Army on the following day.

The undue burden on the limited rail net forced dependence on highway transportation for a substantial part of all supply shipments. As a result, the roads soon became favorite targets for partisan raids. This was especially true for stretches leading through dense and extensive forests where the partisans found perfect concealment and could not be pursued by German troops. The tactics employed in these raids followed generally the same pattern: A German motor convoy traveling through a dense forest would suddenly run into a log barrier constructed at a blind spot on the road and, while coming to a halt or trying to turn around, would be exposed to devastating enemy fire from all sides. If any vehicle managed to escape to the rear, it was only to be caught and destroyed in another road block set up by the partisans.

Conclusions

From the wealth of practical experience gained during the Russian campaign, a number of important lessons can be derived. It is axiomatic that the number

of troops required to conduct an *active defense* in rear areas will be staggering and can be made available only at the expense of combat troops at the front. In modern warfare, even an active defense based on the combined efforts of combat troops and security forces cannot assure the complete elimination of partisan activities. It is clear, therefore, that there must be another solution to the entire problem of rear area security.

The only all-inclusive solution to the problem seems to lie in the actual pacifi-

cation of occupied enemy territory. In every country under military occupation there are people, in all walks of life, whose ardent desire is the return to peace and normalcy, not to speak of those among them who, for personal reasons, are willing to support the policies of the occupying powers. Cultivating their friendship, assuring them of one's peaceful intentions, and restoring the safety of their homes, their work, and their subsistence are the best guarantees for real security in the rear of the fighting troops.

NEXT MONTH

Main Articles

Some Military Aspects of American Statecraft by Brigadier General Arthur G. Trudeau; and *The Commander's Estimate* by Lieutenant Colonel Leonard G. Robinson, Jr., are included among the six main articles.

Foreign Military Digests

The foreign digests include "The Future of Surprise" from *The Army Quarterly* (Great Britain); and "The Antiaircraft Defense of Strategic Targets in Southern Germany" from *Flugwehr und -Technik* (Switzerland).

Books for the Military Reader

Reviews of *Policy for the West* by Barbara Ward; and *Rommel, The Desert Fox* by Brigadier Desmond Young are included.

MILITARY NOTES

AROUND THE WORLD



UNITED STATES

Smaller Napalm Bomb

A new napalm fire bomb, smaller but more effective than the type in service, has been developed in Japan for use in Korea.

The new bomb has a 90-gallon capacity, one-fourth less than the 120-gallon tank now used.—News release.

Cargo Ships

The House of Representatives has voted to start construction on a fleet of 50 fast new cargo vessels to strengthen the merchant marine.

The new ships will have a top speed of 22 knots, and will be equipped with their own torpedoes, guns, and helicopters.

This combination will allow them to travel alone instead of depending on convoy protection in wartime.—News release.

Summer Encampments

Attendance at Army National Guard summer encampments in 1951 is expected to exceed the turnout in 1950, when 92 percent of the personnel in all types of units attended camp.

Field encampments will begin early in June and continue well into September, under present plans.—*Armed Force*.

Accident Rate

The accident frequency rate aboard vessels of the Military Sea Transportation Service was 4.67 percent in 1950, its first year of operation.

The marine transport industry as a whole reported accidents, in 1949, at a frequency rate of 24.45 percent. The figures for 1950 are not yet available.—*The New York Times*.

Air ROTC Units

The Air Force has announced that its Reserve Officer Training Corps program will be broadened to include 62 more institutions during the school year beginning next fall. There are now 125 colleges and universities participating in the program.—*Armed Force*.

Military Courses

Columbia University has added six new courses to its program for the spring session to help prepare its students for possible military service.

The courses, each carrying full academic credits, are: Maps and Aerial Photographs, International Morse Code, Basic Electrical Engineering and Electronics, Naval Orientation, Navigation, and Graphic Presentation.—*The New York Times*.

Decentralized Pentagon

The Department of Defense is working on a dispersal plan aimed to move sufficient officers from the Pentagon and other key locations in Washington so that each agency would have a core of command to continue functioning in an outlying area in case of an atomic attack on the capital.—*Army Navy Air Force Journal*.

Rubber Supply

The world supply of new rubber should reach about 2,800,000 long tons in 1951, a new high record amount, unless there is interference with the production and shipment of crude rubber from the Far East.

The supply would consist of 1,860,000 tons of crude rubber and 940,000 tons of man-made rubber, of which 880,000 tons would be produced in the United States. The world consumption of new rubber was 2,240,000 tons in 1950.—*The New York Times*.

New ROTC Units

The Army has announced that specialists' courses will be offered at new Reserve Officers' Training Corps units at 33 colleges and universities in 22 states beginning with the 1951-52 academic year.—*Armed Force*.

Precise Weights

By using newly developed methods, in which results are obtained by observing a finely divided scale with a telescope, objects now can be weighed with a precision of about one five-billionth of an ounce.

This, according to physicists of the US Bureau of Standards, is a notable accomplishment for atomic research where it is necessary to obtain with extreme accuracy the weights of invisible minute matter, representing some of the rarer radioactive isotopes.—News release.

Evacuation Helicopters

The Army has ordered "substantial production" of the Hiller H-23A evacuation-type helicopter. The new helicopters,



Two H-23A helicopters with enclosed, cabin-connected litter containers attached.

capable of carrying two completely enclosed, cabin-connected litter patients, will be used for evacuation of the wounded, transportation of medical personnel, and speedy delivery of medical supplies to critical areas.—*Army Navy Air Force Register*.

New Type Submarine

The Navy has disclosed that it is working on a new type of underwater craft that would be "a true submarine" in that it could stay submerged indefinitely. The new submarine is expected to do 26 knots underwater and 30 on the surface.—News release.

Joint Maneuvers

More than 110,000 soldiers and airmen will take part in joint Army-Air Force maneuvers this summer.

The larger of the two exercises, designated "Southern Pine," will take place near Fort Bragg, North Carolina, sometime in August. Exercise "Timber Line" will take place during June and July in the Camp Carson, Colorado, area.—*The New York Times*.

Army Fatigue Clothes

A new type cotton sateen cloth eventually will replace herringbone twill as the material for Army fatigue clothing.

Developed by the Army Quartermaster Corps in collaboration with the textile industry, the new fabric has been found, after extensive testing, to have much better wearing qualities than herringbone twill.—*Army Navy Air Force Journal*.

Powerful Jet Engine

The Navy has announced the development of what it believes to be the world's most powerful turbojet engine.

The new engine, the J-40 weighs less than 3,000 pounds and packs more potential speed into less space than any jet engine ever built. The J-40 develops a thrust of about 10,000 pounds in comparison with the 7,200-pound thrust of the British *Sapphire* turbojet engine (*MILITARY REVIEW*, Jan 1951, p. 69).—News release.

Nylon Fur

Synthetic fur, fashioned from nylon fiber, may be used soon on US Air Force arctic clothing.

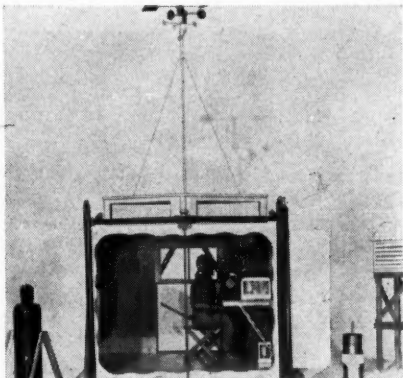
The Air Matériel Command's Aero Medical Laboratory has developed high-quality synthetics that can substitute for the hard-to-get wolf and mouton normally used in trimming and lining parka hoods, flight jackets, and caps used in arctic operations, at a cost of only about a fifth as much as the natural furs.—Air Matériel Command.

Electric Co-Pilot

Development of an electric "co-pilot," which is described as having "unlimited maneuverability," has been announced by the Air Matériel Command. The new autopilot, weighing less than one-third that of the conventional automatic pilots, will be installed in the Lockheed *F-94C* fighter plane.—News release.

Personnel Containers

Engineers in the Air Matériel Command's equipment laboratory soon will be testing a 6,000-pound capacity universal container, which they say might be used to drop an entire infantry squad and its



A model of the universal container.

equipment from an airplane. So far, no one has parachuted down in the container.

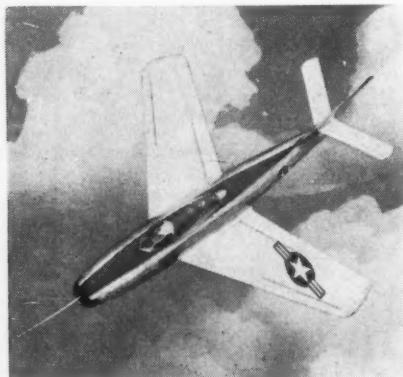
The universal container, along with another cargo container, recently designed by the laboratory, will be used in the newer cargo airplanes such as the *C-119*. The second container, with a capacity of 500 pounds, has been developed for use with the overhead monorail of the *C-119* (*MILITARY REVIEW*, Mar 1951, p. 67).

Still in an early research and development stage, the universal container holds great promise. Besides its use as a transporter of infantrymen and equipment, engineers foresee its utilization as a complete weather station, rescue station, and survival and rescue hut for arctic use. Military Air Transport Service (MATS) already is considering its use as a weather station, to be dropped with men and equipment into inaccessible areas.—Air Matériel Command.

Ground-Support Fighter

Large numbers of a new model fighter plane have been ordered for support of Army ground forces under the Air Force expansion program.

The plane is the *F-84F*, a swept-back wing version of the *F-84E Thunderjet*



The USAF's newest ground-support fighter.

now in service as a ground-support fighter in Korea. It has great fire power for a plane of its type, being able, in certain circumstances, to carry more than 32 high-velocity aircraft rockets.—News release.

Plastic Insole

Less danger from frostbite for soldiers, in such winter climates as experienced in Korea, is promised with a new plastic insole which provides an air space between sock and shoe sole. Being non-absorbent, it drains off moisture from perspiration instead of absorbing it.

The sole is even more valuable in tropical climates. By carrying perspiration away from the feet, it is an aid in controlling such diseases as athlete's foot and others caused by germs and spores of fungus which work through the shoe.—*Science News Letter*.

New Mine Detector

The US Army has developed an improved mine detector which will operate on land and under water. The new detector will locate buried mines in any kind of soil and, because it will operate under water, should prove more effective in clearing beach areas. Older types are useless where magnetite or black earth is prevalent.—*Army Navy Air Force Journal*.

Navy Jet Interceptor

A new carrier-based jet fighter, designed specifically for high-altitude interception, has passed its initial flight tests successfully.

The new plane, designated the *XF4D*, is tailless and is actually a triangular shaped platform wing with a slim nose extending forward to provide a cockpit for the pilot.

The plane is designed to be catapulted from carrier decks and to climb rapidly to the upper atmosphere.—*Army Navy Air Force Journal*.

Rubber Cultivation Project

As a defense measure, the Department of Agriculture will resume attempts to grow and process natural rubber in the United States.

The first endeavor, during World War II, indicated that guayule, the desert shrub from which natural rubber may be obtained, could be grown in this Country.

Improvements in processing methods now indicate greater success for the new project.—*The New York Times*.

De-icing System

A prototype de-icing system for the *H-5* helicopter has been developed by the Air Force. A heater, attached to the helicopter, provides a stream of hot air that is conveyed to the rotor blades and also is used for heating the cabin.—*American Helicopter*.

Radio Photos

Vital battle time is saved by radioing back photographs taken of enemy territory to show battle positions and strength.

At present, the system is effective for only about 100 miles, but is expected to be usable for distances well over 200 miles between plane and ground when perfected.

The pictures are taken and developed by a process which gives a final print in less than a minute.—*Science News Letter*.

Skid-Proof Brake Devices

All B-47 and B-51 airplanes in use by the Air Force now are equipped with two devices that prevent skidding, no matter how much pressure is applied to the brake pedal. Plans are being made to equip other airplanes with the devices, which have been used by railroads for some time and might be applicable to trucks and buses.

The devices, which "sense" a skid, automatically release pressure on the brake until the skidding condition stops. So sensitive is the mechanism that it is possible to bring a heavy airplane to a smooth, non-skid stop no matter how tight the brakes are set.—Air Matériel Command.

Bone Storage

Development of a new method of preserving human bone for "bone banks" has been announced by the Navy.

The new method may allow storage of bones for surgical use for as much as 7 years, compared with an estimated 1-year limit for bones preserved by a previous method involving storage in a deep-freeze cabinet.

The new technique entails only a "quick freeze," followed by drying in a vacuum, then storage in sterile containers at room temperature.—News release.

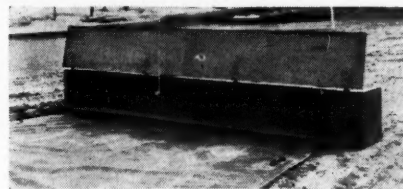
Collapsible Container

The Army Engineer Corps has developed a 10,000-gallon collapsible container to help meet the requirements for storing petroleum products in the field.

The new container is simple to produce, easy to carry, not damaged in storage



The Army's new collapsible container is installed, above, by merely unrolling it like a rug from the protective box, below.



by creasing, and is capable of being installed quickly by troops in the field with a minimum of training.

During the last War, there was a constant demand for storage facilities for petroleum products. The construction of the conventional steel tanks used was time-consuming, and required trained personnel. Collapsible containers were tried, but with little success. The new container, made of *Buna N* synthetic rubber and reinforced with nylon cloth, appears to be the answer to these problems.

This container can be used extensively in forward areas, at truck fill stands, along the pipe line at pumping stations, and for landing operations.—News release.

Overseas Air Bases

France has placed five additional air bases in French Morocco at the disposal of the United States under an agreement concluded between the two countries.

US Air Force engineers will enlarge the bases and install modern equipment, including radar and anti-aircraft protection, but the bases will remain under French command and will be used by both French and United States aircraft.—*The New York Times*.

Frictionless Air Bearings

The first practical use of air bearings has been announced by North American Aviation, Inc., in certain components of guided missiles.

The advantage of these bearings, which are lubricated by a film of air 1,000th of an inch in thickness, is that they have no starting friction. A shaft mounted on air bearings will turn at the touch of a feather and continue turning long after a similar shaft mounted on conventional bearings would have stopped due to friction. The use of air bearings in components of guided missiles takes them out of the experimental laboratory stage and makes practical use of them.—*American Helicopter*.

Giant Presses

The Air Force has announced that it is getting two giant hydraulic presses that could shape metal as though it were paper and greatly speed up making plane parts. The results will be a greatly increased payload capacity and effective range for the aircraft due to pressing the wing in one operation; eliminating separate parts and numerous rivets.

The monster presses, which will tower six stories high, will have a production capacity greater than 50,000 tons, and will be the largest and heaviest ever devised.—News release.

Medical Liaison Teams

The US Army Medical Service and the Royal Canadian Army Medical Corps have formed liaison teams to further co-operation in standardizing military medical instruction and equipment of the two armies.

This liaison is expected to save time and money for both countries through the exchange of specific information in fields in which each is an acknowledged leader. For example, Canada will receive the benefit of American experience in the field of tropical medicine, while the United States will profit from Canadian research and development in arctic medicine, without costly duplicative efforts.—*Army Navy Air Force Register*.

Fast Service Camera

"Two-Minute Minnie," a camera which uses invisible electrical images to produce on-the-spot pictures, has been developed under the sponsorship of the Army's Signal Corps.

The fast-working camera employs a recently discovered electrostatic process in which light is recorded on a selenium-coated metal plate, sensitized by an electrical charge. Where the light hits the plate, electricity leaks off the sensitized material in proportion to the amount of light received, and is grounded on the plate. What is left is an invisible electrical image.

Finely ground charcoal or anthracite coal powder then is blown across the face of the plate. Wherever there is electricity on the plate, the dust sticks, and the more electricity, the more powder remains.

The powdered image then is transferred to ordinary paper or other material coated with an adhesive layer. To protect the surface and fix the print, a clear transparent plastic film is pressed against the picture.—*Armed Force*.

GREAT BRITAIN

Modified YB-1

After intensive flight tests of the Blackburn YB-1 antisubmarine prototype, an increase in the wing span and wing area



The YB-1 with wings folded for storage.

has been made. This modification is expected to increase the performance of the plane under full load conditions.

In order to keep the folded height of the plane within the required limits, it has been necessary to introduce an additional fold in the wing. The extended tips fold down as the outer panels fold up.—*The Aeroplane*, Great Britain.

Radar Network

The British Government is preparing two steps to repair its network of radar defenses.

The Royal Air Force will recall 10,000 reservists skilled in radar operation for 2 weeks' training this summer. In addition, an increasing proportion of the Nation's radio and television industry will go on war work until its output going to the armed services rises to 40 percent or more during the next 15 months.—*The New York Times*.

Seaweed Plasma Tested

Experiments are being carried out in Britain to use laminarin, a chemical derived from seaweed, as a substitute for blood plasma.

One ton of laminarin can be produced from 100 tons of wet seaweed.—*The New York Times*.

Jet Flying Boat

A jet-propelled fighter airplane of the flying boat type is undergoing flight tests in England. It is believed to be the first aircraft of this type yet developed.

The need for a plane that can operate from bays and inlets became evident during operations in the Pacific in World War II.—*Science News Letter*.

New Night Fighter

Production has started on the Meteor NF 11 as the standard replacement for Royal Air Force night-fighter squadrons.



The Royal Air Force's Meteor NF 11.

This plane will replace the Mosquito NF 36, and is expected to go into service this year.

It is a modification of the Meteor, similar to the two-seater Meteor trainer, but carries radar in the nose and has two 20-mm cannon in each wing. No details on its performance are available.—*The Aeroplane*, Great Britain.

NORWAY

Defense Plans

Large air raid shelters will be constructed in Norway during the next 2 years. All cities with more than 12,000 persons have been directed to provide shelters for 20 percent of their populations.—*The New York Times*.

Niobium Deposits

Norway plans to mine large quantities of niobium, a rare mineral used in making steel alloys for jet engines and gas turbines. Large deposits of limestone rich in niobium were found recently in the central district of Telemark.—*News release*.

IRAQ

Oil Pipe Line

A 556-mile oil pipe line is being laid from the petroleum fields of Kirkuk in northeastern Iraq to an outlet on the Syrian coast of the Mediterranean. The new line will have a daily output of 275,000 barrels of crude oil.—*The New York Times*.

ITALY

Destroyer Escorts Transferred

Three destroyer escorts of the US Navy, the *Gandy*, *Thornhill*, and *Wesson* were turned over to the Italian Government recently under the terms of the Mutual Defense Assistance Pact.

The three ships, built in 1943, have been a part of the Atlantic Reserve Fleet.—*Army Navy Air Force Register*.

SWEDEN

Military Training

The Commander in Chief of Sweden's armed forces has asked the Riksdag (Parliament) to alter the Country's draft law to permit the calling up of some 70,000 men for a refresher military training period of up to 6 months.—*The New York Times*.

FRENCH INDO-CHINA

Military Equipment

The United States recently sent 25 B-26 light bombers to French Indo-China, with additional B-26s and F-8-F Navy Bearcat fighters slated for shipment at a later date. Previously, the French and native forces fighting the Communists in Indo-China had received 40 F-6-F Hellcat fighters, artillery, armored cars, ammunition, trucks, landing craft, and light arms.—*Army Navy Air Force Journal*.

Recoilless Weapons

There are indications that Vietminh troops now possess recoilless rifles similar to those developed by the United States.

In recent operations, French forces captured a cache of projectiles for the 75-mm recoilless gun. Front-line troops also have reported observing Vietminh troops firing a cannon that emitted a blast of flame behind it in the same manner as a recoilless weapon.

Captured shells have had Chinese markings on them, and it is thought that the new gun may be entirely of Chinese Communist manufacture on a United States or Soviet pattern.—*The New York Times*.

Reorganize Forces

French forces in Tongkin, originally formed as mobile combat teams, are being organized into division formations.

The French move was dictated by the knowledge that the Communist-led Vietminh Nationalists have organized their troops into brigades, which in reality are the size of Western-type divisions. It is estimated that each of the new Vietminh brigades contains four regiments totaling 14,000 to 18,000 men.

These developments indicate that the Indo-China fighting, at least in Tongkin, has passed out of the guerrilla stage.—*The New York Times*.

BRAZIL

Cruisers Transferred

The light cruisers *Philadelphia* and *St. Louis*, recently taken out of the US Navy's "mothball fleet," have been transferred to Brazil. The *Philadelphia* will be renamed *Almirante Barroso*, and the *St. Louis* will be renamed the *Almirante Tamandaré*.—*The New York Times*.

Manganese Deposits

Work is in progress to develop manganese ore deposits in the Amapa territory of Brazil. A 35 million dollar loan obtained from the World Bank is financing this activity.

The territory, it is believed, will produce 500,000 tons of the ore each year, all of which will be shipped to the United States.

The immediate job in connection with developing the territory's deposits is the building of a 125-mile railway from the mines to the Amazon River near Macapa. There modern ore-loading facilities will be installed to serve the ships that will transport the ore.

The projects are expected to be completed late in 1952.—*The New York Times*.

Rubber Consumption

Brazil has ordered 2,900 tons of crude rubber from Singapore because local consumption has outstripped production. Brazilian rubber consumption is estimated at 30,000 tons this year, or about 10,000 tons more than present Brazilian crude rubber production.—News release.

INDIA

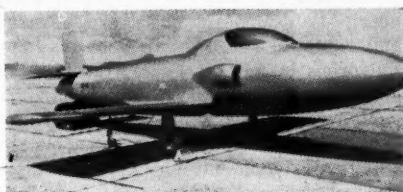
Uranium Deposits

Indian Atomic Energy Commission geologists have discovered two substantial uranium ore belts. One belt of 50 miles is in eastern India; the other runs northwest from central India.—News release.

AUSTRALIA

Research Plane

Australia has started flight tests of a jet plane, below, which is intended as a



pilotless target and for guided-missile research. Initial tests are being performed with a pilot.—*The Aeroplane*, Great Britain.

Military Service

Australia's Minister of Labor has announced that immigrants will be liable for service under the new draft service scheme.—*The Christian Science Monitor*.

Resources Board

Australia has organized a new National Security Resources Board to advise the Government on the best use of the Country's resources in the interests of national security. The functions of the board will be similar with those of the United States National Security Resources Board, but drafted with Australian conditions in mind. Members of the board were selected for their special knowledge of industrial and war administration.—*Australian Weekly Review*.

FRANCE

Maginot Defenses

A French Senate committee which spent a week examining the condition of the Maginot Line has announced that the 125-mile line of fortifications is usable and can suffice for repulsing a hostile attack.—*Allgemeine Schweizerische Militärzeitschrift*, Switzerland.

CANADA

Defense Program

Canada has announced plans for a 5 billion dollar, 3-year defense program.

The program is intended to provide for nearly 100 ships for the Navy, manned and equipped; 40 regular and auxiliary squadrons in the Air Force; the addition of approximately another division; administrative and training establishments; and equipment and supplies to enable the Country to meet the shock of mobilization.—*The New York Times*.

WESTERN GERMANY

Shipping Industry

West German shipping concerns have bought about 120 seagoing vessels totaling 400,000 tons from abroad since World War II. About 50 percent of the vessels were secured from Great Britain.—News release.

USSR

Jet Fighters

The MiG 15 is in service with Soviet air force units in Germany, and the type now has been identified in the vicinity of the air corridors to Berlin. This means that the MiG 15 has replaced the La 9s which were prominent during the Berlin Airlift. If re-equipment is complete, it may mean that up to 1,000 aircraft are involved.—*The Aeroplane*, Great Britain.

Prospecting Activity

Soviet prospectors are searching in South China for new deposits of wolfram ore, according to reports from Canton.

This strategic mineral is the source of tungsten, which is essential for hardening steel and making armor plate.

South China, until it came under Communist occupation, was one of the principal suppliers of wolfram ore.—News release.

Foreign Military Briefs

Britain's greatest aircraft carrier, the 37,800-ton *Eagle*, under construction since 1942, soon will be ready for service.

Two Swedish munitions plants are producing a new radar fuze similar to the proximity fuze developed by the United States.

The Australian Army is being equipped with the new British *Centurion* tank.

Venezuela has started construction of her first steel plant. It will be the second of its kind in South America. Chile recently inaugurated a similar project.

Dutch production of oil reached a monthly average of 56,000 tons in 1950 as against 51,700 tons in 1949.

The Australian Government is contributing more than 56 million dollars to Southeast Asian countries under a British Commonwealth aid plan.

Brazilian business men declare that 4 billion cruzeiros (about \$200,000,000) is needed to build up a stock pile of foreign raw material to feed Brazilian industry for 1 year.

A marine gas turbine engine, the first for installation in a commercially operating merchant ship, has been built and tested in Great Britain.

Deliveries have begun on an undisclosed number of F-84E *Thunderjet* fighter aircraft to North Atlantic Treaty nations as part of the Mutual Defense Assistance Program.

Italy will take her first national census in 15 years beginning 4 November 1951. The census will cover population and industry.



Offensive and Defensive Action in Cities

8-1207

Translated and digested by the MILITARY REVIEW from an article
by Colonel Antonio Saltini in "Rivista Militare" (Italy) December 1950.

UP to World War I, cities possessed military importance only if they included fortifications, military stores, or were the seats of government. Cities, themselves, were of little importance. Military commanders preferred open terrain, and operations were conducted away from cities where there was more room for maneuver.

In World War I, due to the total aspects being assumed by war, cities assumed sociological and economic importance because of the population and the industries concentrated in them. However, in the operational field, the importance of cities still was of minor importance; attacking forces avoided them, and defending forces did not seek them out.

It was the Spanish Civil War which, for the first time, brought out the importance of cities in warfare; an importance which was confirmed in World War II.

The increase in the importance of cities is due to two main factors:

1. The extensive use of armored and motorized forces.
2. The concentration of forces and effort characterized by modern warfare.

In modern warfare, the offensive, once the break-through has been achieved, must penetrate rapidly into the enemy's rear

areas. Only because of this does it succeed in maintaining its superiority over the defensive, and thereby avoid the necessity for launching successive attacks. Armor, because of its mobility, is the primary means for exploiting the penetration. Therefore, anything which contributes toward reducing the speed of the offensive and, particularly, toward hampering the progress of armored and motorized forces is an element of great value to the defensive forces. Cities, located as a rule at convergent places on the routes of communications, are particularly suited for halting armored and motorized forces, if organized for defense. Not only is this true because they limit the possibilities of movement, but also for the reason that they favor the employment of antitank weapons by the defensive forces.

Defensive Values

Modern combat requires a great concentration of effort on the part of the attacker. Defensive forces, on the other hand, generally are numerically inferior. and, therefore, must use strong points to compensate for this weakness.

Cities, particularly, are fitted for constituting the framework for powerful strong points. This is due not only to

their value as obstacles to movement, but also to their capacity for resisting air and artillery bombardment.

Madrid, Leningrad, Sevastopol, Stalingrad, and Budapest were familiar names to all during the Spanish Civil War and World War II. Each of them stood for the arrest, for several months, of powerful offensives.

It seems likely that not even the atomic bomb will diminish the operational importance of cities. Small cities would not constitute an economical objective for it, and large cities, once cleared of their inhabitants, would provide considerable protection for the forces charged with the defense.

Characteristics of Cities

The principal tactical characteristics of cities are:

1. Limited fields of fire.
2. Height (as distinguished from the two dimensional concept of the battlefield—width and depth). Thus, cities can be regarded as accented terrain, with some resemblance to mountainous areas.

From the standpoint of the development of the battle, these characteristics mean:

1. Slowness in offensive action, due to the difficulty of movement.
2. Ease of surprise, resulting in difficulty of command and the necessity for extensive decentralization during operations.
3. Close combat at very short distances.

None of the characteristics named is favorable to the offensive, but several are favorable to defensive operations.

Although cities favor defensive operations, it would be erroneous to assume that they permit economy of force. On the contrary, they absorb additional personnel. However, offensive action in cities requires a far greater number of personnel for the attacking forces and, therefore, constitutes an element of economy of force for the defense.

Offensive Action

Offensive action against a large city, organized for defense, will have to be minutely planned and methodically carried out. It will comprise the following phases:

1. Reconnaissance.
2. Envelopment.
3. Preparatory bombardment.
4. Occupation of a line of departure.
5. Attack.
6. Mopping up.

Reconnaissance will be carried out by the air force (especially by means of photography), by patrols, and by spies.

The *envelopment* will be effected, preferably, by armored forces. Its purpose is to prevent reinforcements of personnel and weapons from reaching the defending forces. At the same time, it will cut off the enemy's retreat route and eliminate enemy artillery capable of supporting the defense from outside the city.

In the *preparatory bombardment*, aircraft and artillery will be employed. The purpose of this action is to intimidate the enemy, to open passages through mine fields, and to force the enemy to take refuge in basements.

The *occupation of a line of departure* will require, normally, the capture of the terrain from which the attack will be launched, providing the defense still has active elements outside of the city. This action will be carried out by forces different from those destined for the attack on the city.

The *envelopment*, preparatory bombardment, and occupation of the line of departure should take place, if possible, simultaneously.

The *attack* will be executed by infantry and engineer forces supported by tanks, self-propelled assault guns, artillery, mortars, smoke-screen equipment, and flame throwers.

The attack formations will be organized in depth and, normally, will include three echelons:



Modern warfare has placed greater emphasis on cities; both for the offense and the defense. Above, smoke clouds the area as United Nations troops fight it out in the streets of Seoul, Korea. Below, infantrymen dash along the main street in Trier, Germany, during the World War II battle for that city.—Department of Defense photos.



1. The attack echelon: divided into assault and fire support groups.

2. The replacement echelon: to permit rotation and replacement of losses sustained by the attack echelon.

3. The reserve echelon: for use in repelling counterattacks and for mopping up.

Atomic attack?
Defensive Action

The tactical characteristics of cities favor the defense, even when they are surrounded by commanding heights. However, defensive action in cities presents a few unfavorable factors. Fields of fire are limited; action is decentralized; and the deployment of troops is inflexible due to the physical characteristics of cities. Also, the allocation of forces is a complicated problem.

The organization of the defense, therefore, must tend toward the elimination or reduction of these unfavorable characteristics, and the augmentation of favorable factors. These will include:

1. Clearing of debris to ensure fields of fire (this taking precedence over all other efforts).

2. Opening passages in walls and locating subterranean tunnels to facilitate counterattacks and withdrawals.

3. Laying mines and constructing obstacles.

4. Providing cover against enemy fire and chemical agents.

The organization for the defense will comprise:

1. A marginal defense, co-ordinated with exterior fire elements for the protection of the flanks.

2. Concentric defense zones.

3. A central redoubt, organized as a strong point, with ample possibilities for counterattacks and for laying down fire on the most dangerous routes.

If it is a large city, it will be divided into sectors, each of which must be capable of independent action. The conduct of the resistance must be characterized by aggressiveness and stubbornness.

It will be, principally, the individual actions, conducted by the smaller units, which will decide the outcome of the battle.

8-1205

Lessons to Learn

Digested by the MILITARY REVIEW from an article by Captain G. S. Powell in "The Army Quarterly" (Great Britain) January 1951.

AN ACCUSATION which is made regularly against the British Army, in common with most other armies, is that it spends most of its time in peace preparing for the last war. Unkind critics even have accused it of preparing for the last war but one.

To a large extent, this accusation is true and is likely to remain true. The reasons are simple. It is difficult to experiment successfully in peacetime. Money and men's lives are the raw materials required for most military experiments, and while the former is in short supply in

the majority of peacetime armies, the latter commodity is not available at all. However, they are readily available in war, and the stresses, strains, and emergencies of battle provide the impetus which produces new ideas. There are, of course, exceptions to any rule, and sometimes a radically new theory is produced during peacetime. An example of this is the use of mobile armor as evolved by some of our junior generals in the early 1930s—a theory which, unfortunately, brought benefits not to ourselves, but to our future

opponents, who were only too quick to see the possibilities of this new method of waging war.

While we always cannot be clever enough to see into the future (although it is the Army's job to try its best to act as crystal-gazers), we can ensure that the lessons of the last War are thoroughly, not superficially, examined. The reasons why and the methods by which we and our Allies won the last War have been, and still are being, examined with the utmost care. But the methods by which the Germans fought will repay study, and it is doubtful whether these methods, as yet, have been examined in anything but a superficial manner.

In examining these German methods, there can be no question of treating their Army as something out of the ordinary, a mistake which we rather naturally committed in the middle of the last War. Probably no country as warlike as Germany has ever before been so decisively beaten in battle. In 11 months of fighting on the Western front alone, up to the end of April 1945, they lost 3 million prisoners, a rate of 9,000, or one weak division, a day. This is over and above their casualties in killed and wounded. It will need very clever propaganda to evolve a "stab in the back" theory this time to explain away their undisputed defeat in the field. The reasons for this defeat have been examined thoroughly, and we know that, among other things, the inept strategy of Hitler, the decline in German generalship through the Fuhrer's overcentralization, and the lack of inter-service co-ordination helped our victory. But the Germans must remember also that they were beaten, man for man in the field, by all-around better fighters.

It is not possible to excel in everything, and in war, as in most things, one country will be better at some things than at others. If we had been unfortunate enough to lose World War I, there is no doubt that the Germans would have found

a lot to profit by from the study of our methods. During the War, we learned much from them. The development of airborne forces and the use of aircraft in the support of ground forces are two fields of activity in which we received rude shocks in the early days, and in which our technique eventually excelled that of the Germans. On the other hand, however, there are some subjects in which they always appeared to be slightly our masters: and about which, even now, we have a lot to learn.

One of the most noteworthy characteristics of the German Army was its ability to raise and reorganize formations at short notice. Units of the British Eighth Army will always remember the Hermann Göring Division which continually, after successive annihilations, seemed to be reappearing in the enemy Order of Battle. On a larger scale, we shall remember how near we thought ourselves to victory on the Western front in September 1944, and our surprise at finding ourselves faced in the Siegfried Line by a series of new, or reformed, German armies. The methods by which their staffs raised and organized such formations, and the methods by which their regimental officers welded them into fighting units in the space of weeks, would amply repay study. Allied to this was the Germans' skill in regrouping their shattered units and formations in the middle of an action into improvised "battle-groups," still capable of offering sturdy and usually unexpected resistance.

Such masterpieces of reorganization were accomplished with staffs much smaller than those of the British and United States Armies. Those who saw them will never forget those anthills of staff officers at Cairo, Algiers, and many other places, controlling what were often only a handful of divisions. Such huge headquarters did not appear to have been a characteristic of our opponents.

In peace as well as in war, a very high proportion of our officers seem to dis-

appear behind the desks of our headquarters. In fact, the proportion of staff officers to fighting troops is probably even higher in peace than in war.

One reason for the inflated size of our staffs is that we operate, both in peace and in war, at the end of very long lines of communication maintained, often under difficulties, by sea, air, and land transport. This involves large transportation and logistic staffs, together with equally large engineer, signal, and maintenance service staffs. On the other hand, in the last two wars, our opponents usually were operating on much simpler interior lines of communications. In addition, the lack of trained clerks at our headquarters resulted, and still results, in large numbers of junior staff officers performing purely clerical duties.

But, nevertheless, it would appear that there is room for making a fundamental examination of our staff organization, and that, in doing so, useful lessons could be learned from studying the methods which the Germans used. Far too many of our officers are lost in the complex labyrinths of our staffs, and far too much of our resources, both in men and in materials, are used in the maintenance of these staffs.

It is doubtful if our standard of generalship has ever been at a higher level than it was at the beginning of 1945. The War produced a magnificent corps of young generals. But most of these generals were, in 1939, comparatively junior officers and the results produced by some of their seniors, in the early days of the War, often left much to be desired. Even in 1942, Rommel still could comment:

As always, the British Command showed a marked slowness in reaction: as always, the British High Command showed its customary caution and little forceful decision; and it had not drawn the inferences which it should have done from the defeat of 1941-42. Prejudice against innovation is a typical characteristic of an Officer Corps which had grown up in a well-trying and proved system. . . and, besides this, the British Command never acted very quickly.

Wavell's and O'Connor's First Desert Campaign and Martell's handling of the 50th Division at Arras, in 1940, are exceptions, but on the whole our standard of generalship in the early days of the War did not approach that of the Germans. Inept as they may have been at times toward the end of the War, their initial campaigns against Poland and France were brilliant, both in planning and in execution, even though the opposition they were facing was not particularly strong.

In the years immediately before the War, the German General Staff had the opportunity of handling large formations during training and, in addition, had the benefit of knowledge gained during their intervention in Spain and the advances into Austria and Czechoslovakia. Our senior commanders rarely had the opportunity of handling troops in the field and, when opportunities did arise, they only saw a couple of divisions at a time. Nevertheless, this is not the only reason for the disparity in standards. One has the impression that too many of our generals were occupied with the minor details of peacetime administration, and that too little time was spent in the study of waging modern war. Then, as now, the Imperial Defence College, and an occasional exercise without troops, offered the only opportunities for the study and practice of their profession.

Infantry tactics and training are other subjects about which we have much to learn. Rommel again makes an interesting comment about some of our best troops at Knightsbridge whom he describes as "... a living embodiment of the positive and negative qualities of the British soldier. An extraordinary braveness and toughness was combined with a rigid inability to move quickly."

Blumentritt, the last commander of the German First Parachute Army, when asked his opinion of the British soldier, said, "Once the British had got their teeth in and had been in a posi-

tion for 24 hours, it proved almost impossible to shift them," carefully avoiding commenting on our abilities in the attack or war of movement. Most infantry officers who fought in the War will agree with these opinions.

The German also proved himself a tough fighter, both in this and in World War I. Although no better than us in a defensive battle, he often showed himself to be our superior in his technical handling of weapons, junior leadership, and tactical skill. Even in the latter stages of the last War, we found reason to respect him, and this was when we had complete command of the air and a great superiority in all supporting arms.

This military ability, in part, can be attributed to the fanatical propaganda inculcated into their youth and, in part, to the inherent fighting qualities of the German Nation. But the standard of training and leadership of their junior and noncommissioned officers, who succeeded in handling so skillfully, those heterogeneous units, was of even greater importance. We surely can learn something from their tactical doctrine, and even more from their methods of training their junior infantry leaders.

It seems that in the fields of organization, staff work, generalship, and infantry training, we still have lessons to learn, and one cannot but feel that our victories of 1944-45 have, in some way, made us forget that there are lessons as yet unlearned. Probably much research is being carried out, about which the average officer knows nothing, but one feels that full use has not yet been made of the complete German records which we have at our disposal and the services of a corps of officers who have proved themselves only too eager to give us the benefit of their knowledge.

This article may appear to offer only destructive criticism and not to produce any specific suggestions for curing certain defects which appear to have existed, and perhaps still exist, in our Army system. But it must be emphasized that the writer's object is only to suggest a line of study. The actual production of the thesis could be done by a small staff having access to all captured German documents.

Let us avoid the self-satisfaction of final victory and remember that we still can learn much, even from our enemies who were beaten.

Since the end of the second World War, political, social, and scientific changes have confronted the military profession with new concepts. Unfortunately, many unsound beliefs arose, particularly to the effect that armies were outmoded. I feel confident, however, that the doubt and confusion now are clearing away, as developments all over the world bring out the role of the Army in bold relief.

Lieutenant General M. S. Eddy

The Artillery Attack

Translated and digested by the MILITARY REVIEW from an article by Colonel Gino Ferrari in "Rivista Militare" (Italy) August-September 1950.

7-2169

DURING the early phases of the last War, it generally was admitted that the decisive factors in the battles were armor and air power; with little credit being given to infantry and artillery. However, as the War continued, it was shown that the infantry and the artillery were vital factors in battle and that the earlier misconceptions were due, mainly, to the faulty employment of these forces.

It is the purpose of this article to show the importance of artillery, and the role that it played during the last half of World War II. A particular examination also will be made on the employment of the Soviet artillery.

Artillery Support Required

During the first years of the War, there arose many situations in which, despite the support of tanks and aircraft, it became impossible to achieve success in an attack without strong artillery support. Therefore, as the War progressed, it became customary to make greater use of massed artillery fire. It was the Soviets who first felt this need and employed powerful masses of artillery.

The Soviets had learned that the use of supporting artillery fire, based on pre-war methods of employment, did not produce the desired results, and that new methods of employment were required. They discovered that:

1. The infantry cannot be expected to make a successful attack, without excessive losses, unless the enemy fire is neutralized by massing overwhelming artillery fire, in depth, on the attack positions. Only the co-operation of powerful masses of defiladed artillery, along with the fire power of direct fire artillery, is able to neutralize the enemy positions, obtain the

maximum effect, and solve the various fire problems in a rapid and economical manner.

2. Attacks by tanks must be supported effectively by the artillery; otherwise they will become easy prey for the enemy anti-tank weapons. The more tanks employed in the attack, the more artillery required in their support.

3. The flanks of the units employed in the attack must be covered, especially where it is expected that a counterattack may develop. It is necessary, therefore, to establish artillery reserves, particularly reserves of self-propelled artillery, in order to provide greater flexibility of action.

As a result of these concepts, the Soviets, during the last months of 1941, started using massed artillery; a practice which they continued throughout the War. From 1943 until the end of the War, the Soviets, in any action of major importance, did not use less than 322 guns for each mile of front, and, at times, increased this to 805 guns for each mile of front. The employment of this imposing mass of artillery is called, by the Soviets, "the artillery attack."

In order to provide efficient employment of such large numbers of artillery, the Soviets established artillery brigades and artillery divisions. These same types of organizations later were adopted by the Germans.

Mobility Required

Supporting artillery should have mobility. It should be able to displace rapidly and resume firing without difficulty. The mobility of the Soviet artillery divisions was equal to the mobility of their armored divisions. On various occasions, Soviet artillery divisions were able to leave their positions, move to new locations 90 miles

away, and begin firing within a 24-hour period.

German artillery divisions, on the other hand, did not possess this mobility and, therefore, were dissolved later in the War.

The artillery attack, from the viewpoint of time and space, is divided into three phases by the Soviets:

1. Preparation of the attack.
2. Support of the infantry and tanks in their attack of the margin of the enemy's defense system.
3. Support of the infantry and tanks in the interior of the enemy's defense system.

Although these phases may not be new, a few of the methods used in their employment are of interest.

First Phase

The Soviet artillery preparation, as a rule, consisted of co-ordinated fire by the division, corps, and army artillery. Targets included antitank weapons and tank obstacles; fortifications and machine-gun positions; observation posts and command posts; communications networks; and supply centers.

In the armored attack, the first objective was the destruction of antitank guns and tank obstacles. During the preparation, the self-propelled guns did not reveal themselves unless such action was called for in the fire plan. As a rule, the preparation reached a depth of from 2 to 3 miles and, at times, up to 5 miles in depth. The Soviet artillery preparations often accounted for 60 percent of the enemy's losses.

Direct fire artillery was necessary in order to obtain maximum effectiveness against fortified positions and to reduce the losses among the infantry. The Soviets usually employed about 25 percent of their artillery in direct fire support, at distances of from 200 to 1100 yards from the objective. The employment of pieces ranging from 122- to 203-mm in

size in direct fire support was not unusual. Also, it was the Soviet practice to use large numbers of direct fire artillery—77 guns for each mile of front at Stalingrad and 68 guns for each mile of front at Sevastopol. This direct fire support required powerful masses of defiladed artillery to take care of counterbattery missions in order to provide protection for the exposed direct fire pieces.

Counterbattery fire proved itself to be of particular importance in the outcome of every battle. At the beginning of the War, the Germans believed themselves capable of effecting counterbattery fire by means of aerial bombing. However, they soon learned that this method was not effective against the large masses of Soviet artillery. After an aerial bombing of several minutes' duration, Soviet artillery was able to go back into action almost immediately. However, the Soviet's counterbattery fire, repeated several times or maintained for a certain length of time, was capable of interrupting the activity of the German artillery.

Second Phase

The artillery organic to the regiments, and the direct fire weapons from division artillery, constituted the accompanying artillery during an attack. Such artillery received their orders from the infantry company and battalion commanders during the attack. Generally, two to four pieces of direct fire artillery accompanied each infantry company in the attack.

The division artillery, which was not used in direct fire support of infantry companies and battalions, was employed in direct support of the regiments. For this purpose, groups were formed from division artillery and reinforcements from the general artillery reserve.

The corps artillery provided the moving barrage in front of the infantry and the tanks during the attack. The moving barrage was extended to the range limits

for each particular piece, and shifted in range and deflection, according to definite fire plans.

The army artillery took care of counterbattery missions, as well as missions against enemy reserve and communications centers.

The self-propelled artillery, and a specified number of tanks, provided flank protection for the attacking elements. The self-propelled artillery proceeded in bounds of from 430 to 550 yards—providing greater accuracy than was possible by the use of tank weapons.

There were two conditions which were indispensable for obtaining maximum success in this type of attack:

1. Perfect co-operation between the direct fire and the indirect fire artillery.
2. Maximum use of the moving barrage by the attacking infantry and tank elements.

Third Phase

The third phase, the support of the infantry and tanks in the interior of the enemy's defense system, generally, was a continuation of the second phase. In this phase, the artillery, infantry, and tanks had to possess flexibility in their operations in order to exploit any sudden break-through or change in the battle. This generally was accomplished by changing from centralized to decentralized control, depending upon the situation.

The Soviets attribute the German defeat, which began with the Battle of Moscow and the retaking of Stalingrad, to

the indisputable superiority of the Soviet artillery.

Conclusions

1. An attack, even though supported by tanks and aircraft, cannot be carried to a successful conclusion without strong artillery support.
2. Artillery support, in order to be effective, must be massed.
3. In order to employ massed artillery efficiently, it must be organized into large units of a permanent character.
4. Artillery must possess mobility and be able to displace and move great distances without reducing its efficiency. Therefore, it must be mechanized or motorized.
5. Direct fire artillery must be employed with massed artillery to ensure maximum success.
6. Artillery must be so organized and co-ordinated that it can be employed under centralized or decentralized control.
7. Artillery must be capable of massing large units of fire on a single target within a short period of time.
8. The artillery attack can be successful only if there is perfect co-operation between the direct fire and indirect fire artillery, and if the attacking infantry and tank elements make maximum use of the moving barrage.
9. The combined training of all forces must be perfected to the point where maximum co-operation and mutual confidence is achieved.

The Army's research and development program is designed to meet the ever increasing need of the combat soldier for new and improved weapons. It is an expensive process, but the results obtained in the past War testify eloquently to the soundness of the investment.

General J. Lawton Collins

Benelux and the Economic Unification of Europe

Translated and digested by the **MILITARY REVIEW** from an article by Gaston Craen in "La Revue Nouvelle" (France) July-August 1950.

WITHIN a short time, the Belgium-Netherlands-Luxemburg economic union will be a reality. However, almost 6 years have elapsed since the governments of the three participating countries took the first steps toward the formation of this union. It was in September 1944 that a customs agreement was concluded in London between the three governments in exile—an agreement to enter into as close an economic relation as possible.

This agreement was made at a time which was favorable for its success. During a time of economic prosperity, no government desires to enter into agreements which would change the economic, social, or political structures of a country. However, these three countries were looking for ways to improve conditions, and an economic union seemed to offer an excellent solution to the problem.

Progressive Stages Required

Nevertheless, a long period was still to elapse before it was possible to take the first steps toward the execution of the agreement. There were many preparations to be accomplished in each country before any unified attempt could be made to change existing economic, social, and political structures. The successive stages which had to be achieved in each country before unification could be complete included:

1. The establishment of uniform import duties.
2. The creation of uniform customs legislation and regulations.
3. The unification of excise duties.
4. The elimination of quotas, licenses, and other restrictions of international commerce.
5. The unification of economic policies

as regards money, credit, agriculture, industry, and commerce.

The execution of this program was hampered by many unforeseen difficulties, so that the target date of 1 July 1949 was extended to 1 July 1950. This change was necessary in order that the countries could effect changes in existing legislation that might injure the successful progress of the union.

An Example for Western Europe

The example of Benelux has attracted much attention abroad, as well as providing an example for other countries of Western Europe. The fundamental malady from which Europe suffered between the two wars was economic nationalization. This was due, mainly, to the desire of each country to safeguard its economic welfare through the use of customs, tariffs, and other barriers. Other countries made reprisals with similar barriers, and the situation steadily became worse as the economic policies of the various countries became more and more independent.

The harmful character of economic nationalization was realized by many of the Western European countries during the War, and the atmosphere of postwar planning largely favored the idea of economic co-operation. From its very inception, the Benelux concept met with the warm support of the United States, and certainly contributed to persuading other countries of Western Europe to attempt a solution to the problem through economic unification. It is the influence of Benelux on the progress of this idea that we are going to attempt to describe here.

Co-operation the Keynote

The influence of the Benelux idea has been characterized by close co-operation on the part of all parties. Commercial treaties, tariff agreements, and other negotiations are carried on by delegations composed of technicians of the three countries, acting in the name of the economic entity of Benelux. The influence of Benelux, likewise, has made itself felt in the initiation of the Marshall Plan.

As is known, the American offer was contingent on the condition that Europe make a considerable effort toward ensuring her recovery. At the very beginning of the European Organization for Economic Co-operation (EOEC), the emphasis was placed on the possibility of instituting customs unions.

For the purpose of examining this possibility, 13 of the countries participating in the EOEC decided to constitute a study group in which the specialists of the three countries of Benelux played an important role.

Due to their experience, the documents prepared by the Benelux members were adopted as the basis for discussion. The study group likewise accepted, without reservation, the principles laid down by Benelux as regards the successive stages necessary for realizing an economic union—stages which were described earlier in this article.

It also was the example of Benelux that inspired France and Italy to attempt to form a customs union between the two countries. If this agreement is not completed, it will not be due to the efforts made by France and Italy, but to the success of a program of a larger scale.

The Benelux countries also were invited by France and Great Britain to participate in the discussions relative to the status of Germany. If they had not adopted a common attitude, it is

quite possible that they would have been kept out of these discussions.

Beginning of the Brussels Pact

Another important result of the Benelux idea was the invitation, tendered by Foreign Secretary Ernest Bevin, for the Benelux countries to join the Treaty of Dunkirk which existed between Great Britain and France. The three countries reacted immediately, expressing the opinion that it was impossible to have really close political co-operation without economic co-operation.

From this attitude sprang the Brussels Pact, which placed its emphasis on economic, social, and cultural co-operation between the five signatory countries, as well as co-operation in political and military activities.

In the meantime, it became evident, in the EOEC, that certain problems, especially with regard to payments, could find no solution without passing through the phase of regional agreements. On 2 November 1949, the EOEC recommended the creation of such agreements for the purpose of attaining the ultimate objectives of European co-operation. This was due to the recognition that agreements, similar to those of the Benelux countries, were necessary in order to open the way for a progressive economic unification of Europe.

It goes without saying that the contemplated agreements were by no means to result in the establishment of independent groups. The groups created were to remain open to all the member countries of the EOEC, with all countries assuming the obligations agreed upon. The essential objective would be the progressive liberation of all exchanges of goods, capital, and services.

Political Harmony Necessary

It was thought, at the beginning, to form regional groups which eventually would be transformed into a large, uni-

fied economic system affecting most of the nations of Western Europe. However, it soon was realized that the larger the plan, the greater the difficulties which stood in the way of the union. This has resulted in two distinct views; one group advocating smaller unions, and the other advocating more effort to achieve a more comprehensive union. This problem should be easy to solve once there is an agreement on political problems—the major difficulty at the present time.

Moreover, political harmony cannot be attained without the co-operation of all the interested countries; France, Great Britain, the three Benelux countries, and Western Germany. The participation of Italy is also desired.

Overcoming Problems

One might ask whether the solution of the economic policies of the various powers

in question is possible. Here again, Benelux provides an illustration.

The Benelux countries have had their problems. Belgium is a manufacturing and exporting country with a stable population. The Netherlands has had a great increase in her population and requires more widespread industrialization. In addition, she has had an unfavorable situation in the East Indies.

Nevertheless, thanks to the progress of the Benelux idea, it has been possible to reduce the differences by proceeding by stages. This has required certain sacrifices, but they have been made to achieve the initial goal—an economic union.

The other countries of Western Europe can obtain inspiration from this lesson. Here also, the objective aimed at is so important that its realization is worth the sacrifices. One may be certain that the efforts made now will be amply compensated for in the future.

The Mounting of Raids

Digested by the MILITARY REVIEW from an article by Rear Admiral J. Hughes-Hallett in the "Journal of the Royal United Service Institution" (Great Britain) November 1950.

SINCE history has a habit of repeating itself, it may be worth while to discuss some of the factors which governed the mounting of raids from the United Kingdom during 1942-43. My own connection with the matter was threefold. From January to July 1942, I was one of the group of officers whose duty it was, under the Chief of Combined Operations, to plan raids. I then became the Naval Force Commander for the Dieppe raid, and subsequently continued in command of the Channel Assault Force, commonly known as Force "J."

The Keyes Régime

During the period that Admiral Keyes was Director of Combined Operations,

there does not appear to have been any precise system for planning, mounting, and executing a commando operation. In my judgement, the comparative inactivity of the Special Service Brigade was due to this lack of system, rather than to a lack of equipment or a lack of interest on the part of the Chiefs of Staff. Too much reliance was placed upon personal contacts and, in consequence, the projects were not co-ordinated properly with the Royal Navy and the Royal Air Force operational authorities who would be required to provide covering forces. Norwegian raids were a special case, inasmuch as the Commander in Chief, Home Fleet, was the only authority vitally affected. Admiral Keyes and his senior naval staff

officers understood perfectly how to approach and co-operate with a naval command, and this, I think, was why the only raids of any consequence carried out before 1942 were in Norwegian waters.

The Mountbatten System

An extraordinary position existed toward the end of 1941, when Admiral Mountbatten became "Adviser on Combined Operations." Combined Operations Headquarters controlled, administered, and trained all the specialized amphibious forces in the Kingdom. It also controlled all assault shipping and landing craft. The authority to raid the coasts of France and of the Low Countries was held by the various commanders of the Home Defense armies. Each of these armies had its own sector of British coast to defend, as well as a sector of enemy coast to "mark." In fact, the commanders regarded the hostile coast as the front line facing their armies across a watery "no man's land"! Unfortunately, they possessed no means of their own for crossing this "no man's land," for the idea was that they should obtain assault craft from their local naval commander who, in turn, would ask Combined Operations Headquarters for them. No serious raid ever was carried out under this system.

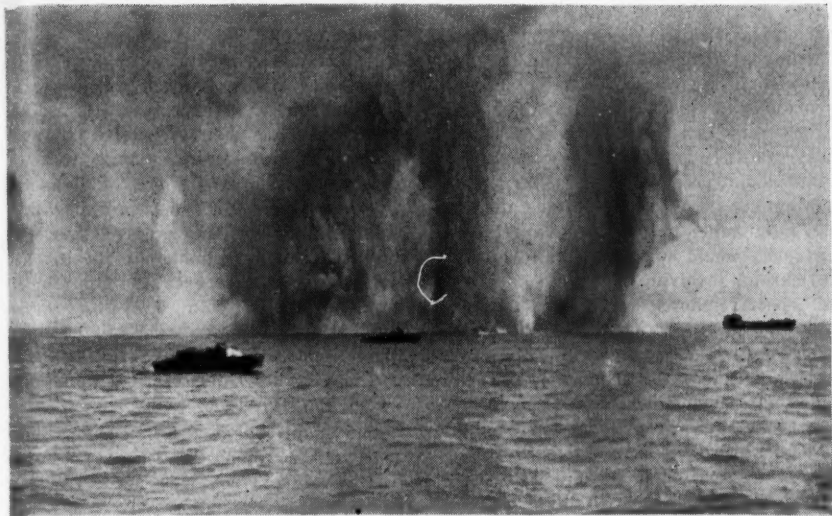
Drastic changes became necessary, in 1942, because, for the first half of the year, it was decided that a series of raids, becoming progressively greater in scale, should be part of our major strategy. These raids were to have a triple objective, of varying relative importance:

1. To divert German land and air forces from the Eastern front.
2. To gain experience in opposed landings, in preparation for our ultimate re-entry into Europe.
3. To boost morale on the home front.

As the year progressed, a definite system was evolved for the execution of the raids, which, for lack of a better

term, I shall call the Mountbatten system. It must not be presumed, however, that this system was the exclusive product of Admiral Mountbatten and his staff. Far from it; we should have preferred something much simpler.

Before describing the system, let us discuss some of the factors affecting a raid against the French coast in 1942. To begin with, any raid which extended into daylight hours was likely to provoke a disproportionate reaction from the German Air Force. This was not necessarily a bad thing. A number of raids and feints were planned, in 1942 and 1943, with the sole objective of bringing on a great air battle. But it is obvious that if, by landing a couple of Commandos for a few hours, one sets in motion an air operation involving a hundred squadrons of fighters, the RAF authorities must be given a large say in the timing and location of the raid. Similarly, though to a lesser extent, the Admiralty was much concerned in all but the smallest raids. It is true that the naval forces needed to cover a Channel operation were relatively small, but so were the number of ships which could be spared without dislocating the coastal convoy timetable. During the period in question, the Battle of the Atlantic was going against us, and destroyers and escort craft were like gold. In addition, the political implications of landings in France called for careful and delicate handling. A vast underground movement gradually was being organized in preparation for the moment when the real invasion would be launched. There was an ever present risk that local enthusiasts would mistake a raid for the hour of liberation, and rise prematurely. (This occurred on at least one occasion, with tragic results.) Another danger was that the Germans would attribute the loss inflicted by small-scale raids to the work of French saboteurs, and exact retribution on innocent hos-



A large-scale raid like that at Dieppe is a daring, hazardous, and complicated operation where success is dependent upon a single, co-ordinated plan of action. Above, bombs dropped by a *Ju-88* bursting among the landing craft as they moved in to evacuate the raiding units. Below, German prisoners being landed in England after the Dieppe raid.



tages. (This also occurred.) Consequently, the Prime Minister insisted that no raid should be undertaken without the full knowledge and collaboration of those responsible for political warfare. Finally, every raid called for intelligence on a scale which no subordinate commander's staff could possibly supply. As a rule, the smaller the raid, the more detailed was the intelligence needed. Only a Whitehall authority could hope to obtain such information, involving as it did the flying of special photographic reconnaissance sorties, the production of special models, and often the employment of special agents. Taken together, these factors ruled out the complete delegation of raiding to authorities outside London, and it is against this background that the Mountbatten system must be judged. Briefly, it was as follows:

The Chief of Combined Operations became the mounting authority for all raids in northwestern Europe. The functions of the mounting authority were:

1. To prepare an outline plan for a raid.
2. To obtain the approval of the Chiefs of Staff for the outline plan, after which force commanders were appointed from each service. (Technically, these appointments were made by the Chiefs of Staff Committee.)
3. To allocate and assemble the personnel and equipment.
4. To assist the force commanders during the preparation of the detailed plan.
5. To act as agent for the force commanders, to obtain any additional intelligence or specialized equipment which they might need.
6. To assist and advise during the training and rehearsal stage.

On first being appointed, the force commanders invariably worked at Combined Operations Headquarters, and their initial task was to produce a detailed

plan within the framework of the approved outline plan. As soon as the detailed plan was ready, they moved to the area where the expedition was being assembled, there to supervise its training and to prepare their respective operation orders. It was at this stage that the responsibility of the Chief of Combined Operations for the operation began to wane, because it was ordered that each force commander should submit his actual operation orders to the appropriate superior authority in his own service for approval. In the case of the naval force commanders, this was the naval commander in chief of the area from which the raid was being mounted.

The naval commander in chief in question held a unique position in relation to the raids, which was never precisely defined. He was necessarily responsible for the detailed arrangements for the sailing, routing, and escorting of the expedition. In addition, he usually was concerned with the final phases of its amphibious training and rehearsal, and, at times, influenced the actual plan of action. For example, the original plan for the abortive raid on Bayonne contained provision for one destroyer to proceed up the river, once the town had fallen, and to bombard certain important objectives which could be destroyed in no other way. Although this had been approved by the Chiefs of Staff, the naval commander in chief refused to approve it, and his will prevailed. But more commonly, the naval commanders in chief took the line that once a force had reached its destination it was not their responsibility to question its plan of action. This was, I think, the correct view, although it is pertinent to add that the Chief of Combined Operations was expressly prevented from any control over the operation, once the expedition had sailed. Thus, it was not clear to whom the force commanders were

responsible once the battle had begun (unless it was to the Chiefs of Staff Committee itself), and it must be remembered that they were often quite junior officers.

Theoretically, however, the Mountbatten system was probably the best that could be devised under the circumstances, and several raids took place while it was in force. In practice, however, things did not work out smoothly as my summary of the system might indicate.

Yet, when every allowance is made, the Mountbatten system, as a system, proved inappropriate to the mounting of large operations such as the Dieppe raid. However, before coming to this, it may be of interest to see how it worked in a specific case, and no better example can be taken than that of the St. Nazaire raid.

The St. Nazaire Raid

This operation was conceived in January 1942, just after Mountbatten's planning staff had been completed. St. Nazaire was picked as an objective partly because we wished to make one or two landings on the Atlantic coast of France, and partly because a glance at the map revealed a fatal flaw in the defenses of the port. The defenses of the port had been planned with insufficient regard to the possibility of ships passing over the mudflats at high tide. Detailed intelligence confirmed this, and we also learned that some months earlier the Admiralty had asked for an attack with the object of destroying the great lock.

The original outline plan was made quickly. An expendable ship, carrying about 200 troops and drawing not more than 12 feet, was to ram the outer lock gate. The troops were to disembark over the gate followed by the ship's company and all were to take cover behind an air raid shelter on the east side of the lock. A heavy charge built into the ship plus scuttling charges then were to be fired,

with the object of blowing a large gap in the outer gate and causing the ship to disintegrate and sink. Special torpedoes then were to be fired by a motor torpedo boat at the inner gate. When the tide fell this gate would collapse, and the entire basin would dry out rapidly, stranding U-boats which were berthed there. Immediately after the explosion, the troops were to carry out demolitions within the dockyard, subsequently embarking near the entrance to the lock in six or eight motor launches, which were to accompany the expedition for this purpose. A sustained air raid was to be synchronized with the amphibious raid, with the object of creating a diversion.

The planning staff had little doubt of the ability of the expendable ship and the motor torpedo boat to carry out their roles, provided that the force was not sighted and identified as a raiding force while en route to the objective. They also were confident that the troops would get ashore with few casualties. However, they were very anxious over their prospects of withdrawal, and much thought was given to devising a better method, but without success.

The plan was approved without delay by the Chiefs of Staff. The three officers responsible for conducting the raid were opposed, at first, to the idea of using an expendable ship. One disliked the idea of having all his troops in one vessel; one was concerned lest the tidal data should prove in error and the ship should run aground; the other, the naval commander in chief, was advised by his staff that a destroyer would "bounce off" the lock gate; and all three were doubtful whether a suitable ship would be made available by the Admiralty. They, therefore, advanced an alternative plan in which the troops would be embarked in a number of small craft (which could only be motor launches) and would be landed at separate points in the dockyard. All dem-

olition work, including that on the lock gates, then would be left to the troops. The Combined Operations Headquarters planning staff, on the other hand, felt no confidence in trying to land troops from motor launches, believing that all might be set on fire before they even got alongside. Furthermore, the alternative plan meant doubling the number of motor launches, and it was felt that 16 coastal craft in formation would arouse the suspicion of the defenses sooner than one destroyer accompanied by a single motor torpedo boat, and followed at intervals by empty motor launches.

In the discussions which followed, the "bouncing off" theory was readily disposed of, because it was possible to consult the engineer who actually designed these particular lock gates! But differences of opinion continued, and eventually the Chief of Combined Operations had to make it clear to the Admiralty that his continued support for the operation was conditional on the plan including an expendable ship to ram the lock gate. A compromise, therefore, was reached in which some of the troops went in the *Cambletown* and some in additional motor launches. But the naval commander in chief insisted that the heavy charge in the *Cambletown* should not be fired until well after the withdrawal, because his staff advised him that everyone within a $\frac{1}{2}$ mile would be killed by the blast. On this point, the planning staff had been guided by the advice of the chief expert on blast at the Ministry of Home Security, who was convinced that the raiders need run no risk from blast whatever. But the commander in chief remained adamant, so the motor torpedo boat during the raid had to expend its torpedoes on a less worthy object, and the great basin, therefore, was not rendered unusable.

Looking at the matter in retrospect, I think it only fair to say that the compromise plan perhaps was sounder than

the original plan, although as events turned out the latter would have been better. But at the same time, the lengthy arguments about a plan which had been carefully worked out and approved in outline were trying from the planning staff's point of view and distracted attention from future operations. This is part of the price one pays in war for an unduly elaborate command setup.

Yet, this system of planning and mounting raids resulted in four medium and one large operation taking place within a period of 8 months. In addition, four more medium and one large operation were mounted during the same period. These failed to take place only because of weather or other causes. No other system, either before or afterward, yielded comparable results.

Large Raids

The system proved unsuitable, however, when applied to larger operations. For example, an attack on Alderney was planned and approved for May 1942, on a scale too large for Commandos alone. Accordingly, troops were allotted from the Home Forces Command, and the expedition was assembled in the Isle of Wight area. When it came to the point, however, differences of opinion arose between the RAF and military commanders concerning the precise timing of the operation. These were not resolved and the operation was abandoned. Similarly, the even larger operation against Dieppe failed to take place in June, as scheduled, because the assault craft personnel were trained insufficiently. This, in turn, was due largely to delays in starting their special training, which was due to the preoccupation of the force commanders with changes in the plan. The operation was delayed 2 weeks later by bad weather, and had to be dismantled temporarily. Looking back on these events, it would have been better to have appointed the force command-

ers from the beginning. Perhaps they never would have produced an agreed upon plan, but at least it would have spared the effort and frustration of mounting unfulfilled operations.

The abandonment of these two raids was felt to be tantamount to a defeat. That was why so much importance was attached to remounting and carrying out the Dieppe raid. A full and fair description of how this eventually was brought about is to be found in the Official History of the Canadian Army. [The account of this raid, taken from the Official History of the Canadian Army, was published in the May and June 1949 issues of the MILITARY REVIEW.]

Another disadvantage of the system, when applied to important operations, was that the Chiefs of Staff insisted upon the military part of the plan being reviewed by a senior general officer nominated by the Commander in Chief, Home Forces. This resulted, in the case of the Dieppe raid, in a complete change in the original outline plan, which altered the whole conception behind the operation as formed in the minds of Mountbatten's planning staff. In the light of subsequent events, I would concede that the original plan had even less chance of capturing the town than that actually adopted, but the price of failure would have been far less, and, after all, the main object of the raid was to gain experience in a large-scale opposed landing rather than to capture Dieppe. A large raid is necessarily a daring, hazardous, and complicated operation and, if it is to succeed, its entire plan must be based upon a single conception, either of one man or of a small group who can work as one. There is no room for a compromise.

Changes After Dieppe

Experience gained during the mounting of the Dieppe raid also proved beyond a doubt that large-scale amphibious

operations in the Channel called for something better than *ad hoc* naval assault forces, formed with pools of landing craft based on and administered by combined operations' establishments. The system proved adequate for small operations, and it worked reasonably well in the Mediterranean where there was no tidal stream and visibility normally was good. Even so, a study of Mediterranean operations reveals errors in the time and place of many landings which would have proved disastrous in an assault on the French coast.

It, therefore, was decided to set up a permanent Channel Assault Force, capable of lifting a brigade group, furnished with its own light escort and close-support craft, and commanded and administered through the normal channels. The object of this force was to carry out future raids, to act as an operational training ground for landing craft commanders destined for the Mediterranean, and to form the nucleus of the naval forces eventually needed to invade France. A division and at least two Commandos normally co-operated with the force.

The establishment of Force "J," as it was named, naturally resulted in a simplification of the system for mounting raids. The provision of intelligence and for obtaining the approval of the Chiefs of Staff continued to rest with Combined Operations Headquarters. However, force commanders were now permanently in existence and had adequate staffs to undertake planning at all stages. Furthermore, the permanent forces required to carry out an operation were, in theory, available. It, therefore, would have been reasonable to expect a succession of large, well-conceived, and faultlessly executed operations. However, only one operation of any size took place, although two were prevented by bad weather.

It would be wrong to attribute this inaction to defects in the system. On the contrary, it was boasted that forces could be ready to carry out the final rehearsal for any operation up to the scale of Dieppe with 3 weeks after receiving the detailed intelligence. Large-scale operational exercises, which involved almost as much effort to plan and prepare as did actual raids, often were carried out at even less notice. The main reason why more was not done was simply that raids had ceased to be part of the Country's main strategy, and that they tended to conflict with training and preparation for invasion, which was Force "J's" prime function. Nevertheless, in 1943, I wanted, if possible, to carry out an occasional raid for reasons of morale. Two or three outline plans were prepared, but in each case the operation fell through on account of the diversion of some essential unit from Force "J" to the Mediterranean. Generally speaking, this was justified, observing that the Mediterranean was the primary theater at that time. But on one occasion, at least, an important operation, which might have had far reaching affects, had to be abandoned because all but three of our Landing Craft Flak were taken away. It was highly questionable whether they really were needed in the Mediterranean, and, at any rate, they were never used. This incident pointed to a genuine disadvantage of shifting the center of gravity of the raiding organization away from London.

Small-Scale Raids

This account would be incomplete without some reference to the small-scale raiding party. This party was conceived, organized, trained, and commanded by two young army officers.

The proposed plan for this force was:

1. That a small-scale raiding force should be formed, comprising 50 to 100

soldiers, 2 motor launches, and some raiding boats.

2. That a special section of the Combined Operations Headquarters staff should be formed to feed the small-scale raiding force with intelligence, to assist in making plans for very small raids, and to secure collective approval for groups of raids to be carried out as opportunity offered, over a given period of time.

3. That the local naval commander in chief should be fully consulted concerning the movements of the force, but would have no responsibility for its operations as such.

4. That the plans always would be of a nature which called for no air support.

By this means, it was hoped to escape from the complexities which had hampered the planning of larger raids, and to carry out a series of pin-prick operations which would mortify the Germans and encourage the French.

The proposal received immediate support. The necessary directives to the authorities concerned were drawn up and approved by the Chiefs of Staff within 2 or 3 days. The Admiralty allocated two motor launches without delay. And then nothing happened. After some weeks, it was asked if the motor launches could be replaced by a motor torpedo boat. We had always felt that the motor launches would be too slow, but, on the other hand, the number of men who could be landed from the motor torpedo boat was very small. However, the change was made, but still nothing happened.

A few days before the Dieppe raid, the small-scale raiding force commander told me that the Commander in Chief, Portsmouth, had said he might land some men near Cherbourg a night or two before the big operation, provided I had no objection and provided my staff would put the plan into proper naval operation orders. This was done, and the first of the small-scale raids took place. As far as I know, the

chief difficulty before had been in the inability of the small-scale raiders to produce an operation order in a form which would inspire reasonable confidence!

After one or two attempts at other raids, the small-scale raiding force commander asked that his small force be placed under the operational control of Force "J." This was approved, and every small-scale raid carried out was done under the authority of the senior officer of Force "J," although we seldom interfered with the military part of the plan. We did find it necessary, however, to go into considerable detail in connection with navigational problems, escort, and cover, and it was not in the least surprising that the small-scale raiding forces should have failed to achieve anything so long as they were entirely independent.

My authority to raid under this system was defined with precision, and was limited to operations involving a maximum of 200 troops. Actually, we never used anywhere near this number. On the whole, the system worked very well and produced results. The only difficulties we met with were occasional attempts at back-seat driving from Whitehall, coupled with a lack of time to study some of the little operations we were authorizing.

Future Policy

Should a situation arise again in which we have the opportunity and the wish to adopt a raiding policy, I think the lessons of the last War point plainly to the correct procedure, so far as small operations are concerned. The first step should be to establish a self-contained joint service raiding force. This force must include all the specialized men and equipment needed for the scale of operations visualized—that is to say, troops, landing craft, close-support craft, airborne troops and their aircraft, and so forth. The force should be under the unified command of either a naval or an air force officer, de-

pending on whether the troops will travel chiefly by sea or by air when proceeding to their objective. The elements of each service within the force should have its own commander, each of whom would be furnished with an operational and administrative staff.

At the headquarters of the supreme command of the area (and I regard it as vital that there should be a supreme commander in each theater of any future war, including the United Kingdom) the force commander should have a very small liaison staff. This liaison staff would be the channel through which intelligence would be obtained, and approval sought for particular operations.

When, however, a large amphibious operation is contemplated, I have little doubt that force commanders with appropriate staffs must be appointed, and must be placed in charge of the planning from the beginning. The forces allotted to the operation must be transferred to their command in stages, as circumstances may dictate. (This was, of course, the method adopted for all the large operations of the last War, except Dieppe.)

It only remains to decide what is a small operation and what is a large one. What, in fact, is the limit to the size of operation which can be effectively entrusted to a permanent amphibious force under unified command, on the lines I have advocated? It, obviously, would be wrong to lay down an arbitrary numerical level of so many troops or so many landing craft: much depends on circumstances, and a raiding force might be counted as small in one theater which would be very large indeed in another. No definition really is necessary because the limiting size of a small raid usually will be apparent in any given situation. However, if I had to make a theoretical definition of a small raid, I should describe it as one in which the operation as a whole (not merely the initial landing) depends upon surprise.

'Mine Terror'

Translated and digested by the MILITARY REVIEW from an article in
"Allgemeine Schweizerische Militärzeitschrift" (Switzerland) October 1950.

IN THE same way that the fear of a sudden tank penetration can influence the thinking and actions of personnel engaged in a defensive operation, fear of mines can influence the thinking and actions of personnel engaged in offensive operations. "Mine terror," by its very nature, produces a restraining effect on troops which reduces their initiative and offensive spirit. Troops, unexpectedly entering mine fields, not only suffer casualties from the weapons themselves, but develop a fear of the unknown, expecting to find mines wherever they step. This fear is further increased when offensive action is conducted at night or under adverse weather conditions.

A Major Problem

The various aspects of "mine terror" did not originate during World War II. They played an important role in the operations conducted during World War I, when wire entanglements with mined areas in front of them were difficult positions to break through. The fear of unexploded mines was ever present; even artillery fire was unable to detonate all the mines and clear a path for the attacking forces.

Experience in World War II showed that "mine terror" held the same fear for attacking forces.

The Russians were masters in the employment of mines; something which the Germans learned very quickly. During the campaigns in Russia, German troops would slow down and become overcautious once they encountered mines, even when barbed wire and other obstacles were not employed.

The Russians never forgot to sow their retreat routes with mines. These weapons

had to be reckoned with even in hastily occupied lines of resistance. German troops passing through cultivated fields or open country often came onto irregularly strewn mine fields, which produced a feeling of uneasiness in the advancing units, inflicted damage on their cross-country vehicles, and produced numerous casualties. The consequence of this was "mine terror," which forced the Germans to advance with more caution; hence, more slowly.

Mines planted on the edge of woods and along forest paths and roads proved to be especially effective. Troops encountering mines at the edge of a wooded area were extremely cautious in moving through the entire area. This caution was increased further by the poor visibility in wooded areas, and a feeling of uncertainty induced by the physical aspects of the terrain.

Extensive Use of Mines

On the Eastern front, the use of mines had an unprecedented effect on both sides. Mine fields containing 10,000 to 100,000 mines were common, and the terrifying effect of these large, mined areas influenced the tactical operations of both sides.

For example, a Russian mine field containing several thousand mines was discovered in a wooded area which was anticipated as an assembly area for several German armored divisions. Since there was neither the time nor the equipment available for an extensive demining operation, the assembly area had to be shifted to open terrain.

An indication of how quickly units can be overcome with "mine terror" was demonstrated in the area northwest of Moscow, in 1943. Unconfirmed reports had been circulated that the Russians were using dogs carrying mines to knock out

tanks. These dogs were supposed to be trained to seek refuge under approaching tanks, whereupon a contact rod on the dogs' backs would cause the mines to explode. This report, and the resultant "mine terror," caused the Germans to shoot all dogs in the area.

Even staffs were not immune to "mine terror." Troop commanders and their staffs repeatedly ran onto mines during offensive operations and were killed or injured. This prompted them to be more cautious, thereby influencing their actions and decisions for future operations.

Combating 'Mine Terror'

It is generally agreed that experience and training are the best methods for solving fear of the unknown. The same is true as regards overcoming "mine terror."

It may be argued that the laying of mines, their removal, and their neutralization are specialized tasks which should be left to the engineers. However, in combat there are never enough engineer troops to handle the mine problem in all areas. Therefore, if all troops are trained in the proper techniques of handling, laying, removing, and neutralizing mines, the problem of "mine terror" can be eliminated.

The Germans found that the training of personnel in the handling of mines and demolitions was an excellent means of preventing or reducing "mine terror."

In 1943, a German corps was faced with the problem of breaking through an extensive mine field on its front. The success of its primary mission was based on sur-

prise and speed, and any bogging down on the edge or in the middle of the mine field would have jeopardized its chances for success. Since the corps front was narrow, and most of the personnel were behind the line in reserve, it was decided to attempt a large-scale training program covering the handling of mines.

The training began with small groups working with dummy mines. When the training had progressed, live mines were used. The final training consisted of exercises simulating actual combat operations in mine fields. During the successive phases of the training, the fear of mines gradually disappeared.

The value of the training was demonstrated by the speed, initiative, and "know-how" of the troops as they penetrated the mine fields on the first day of the offensive. The operation was not only a success, but casualties were extremely light.

On the other hand, the service troops, who had not been schooled in the methods of handling mines, suffered most of the casualties. Curiosity, carelessness, and the belief that there could be no danger in an area through which the combat forces had already passed were the causes of most of the losses.

Summarizing, it may be said that "mine terror," like "tank terror," can be avoided by training troops in the handling of mines. If troops are trained to meet a particular situation, even if it is encountered as a surprise, they will be able to react to it in a calm and efficient manner.

The ultimate test of discipline is combat. The only discipline which will surely meet the test of combat is one that is based on the fact that all hands have pride in a great service, a belief in its purposes, a belief in its essential justice, and complete confidence in the superior character, skill, education, and knowledge of its leaders.

Admiral Forrest P. Sherman

The Application of Science to War

Digested by the MILITARY REVIEW from an article in the "The Hawk," The Journal of the Royal Air Force Staff Colleges (Great Britain) December 1950.

SCIENCE has been used by man to gain his ends in peace and war ever since primitive physics taught him to make fire by friction and to wield a club. However, it was not until the turn of the twentieth century that civilization had reached a stage where science began to command almost every aspect of the lives and thoughts of men.

The measure of the wealth and power of a nation now can be expressed in terms of the wisdom of its science and the skill of its technology. Indeed, war has become a struggle by one nation to overcome the science and technology of another. National strategies are based upon the problems of securing raw materials to feed the machines and protecting the machines from attack.

Science accomplished a revolution in the art of war in only a short lifetime; 30 years from the cavalry charge to that blaze of light at Hiroshima, which made even the blind see that science had assumed the dominant role in warfare.

Although the scientist fashions the major modern weapons and is in a position to determine the main courses of strategy and tactics, the military profession displays a certain lack of enthusiasm in taking full advantage of these facts. It is not difficult to account for this condition.

The first reason is the natural resentment felt by any highly developed guild toward intruders from another and equally powerful guild. It is permissible to make use of the intruders, yes; but permitting them to have a voice in policy making is another matter. It has so happened in the past that science has been pressed into war by radicals within the military group, or by the outside pressure of civilian governments. This tended to cause a harden-

ing of feeling against scientists among the military hierarchy.

Second, the basic education and aims of the two professions differ very widely in purpose. The scientist deals, primarily, with inanimate objects and natural laws; the soldier with men, their handling and discipline. The scientist reaches his decisions by experimentation, by exploring every avenue, deliberately seeking the unusual and unexpected. Time is seldom of great importance to him. The soldier must make his decisions quickly, since the lives of his men and his entire force may be in jeopardy. He tends, therefore, toward the orthodox, timeworn decisions which he has been taught to make. There is little room for experimentation with so much at stake. The scientist is brought up in an atmosphere where complete independence of thought and action is a cardinal tenet. He regards with suspicion any organization which demands rigid obedience to authority.

Finally, although war has spurred science and technology on to greater efforts, and even has served to spread their benefits more widely, the scientist is aware that war, in the end, drains away the resources of mankind, and that future wars may wipe out civilization itself. Even when recognizing that another war would be only in defense of his way of life, the scientist is reluctant to give his talents to the arts of destruction. He is, above all, a builder, not a destroyer.

World War I

World War I passed rapidly from a stage where it had been conducted mainly by a certain class of society, in accordance with well-established rules, to a condition where every class and element of society

was involved. With some exceptions, the first major employment of science by both sides was turned to the problems of technology, in an effort to increase the production of goods needed at the front.

When a stage of deadlock had been reached, science gradually was deployed on the development of new weapons. Methods of determining what new weapons should be developed were haphazard and normally dependent on chance. Little faith was given by the higher commands to the latent possibilities of new and untried weapons. As a result, the chance to exploit the tank was lost by the British; and the Germans failed to exploit poison gas.

The Years Between Wars

So far as the military profession was concerned, no clear lessons emerged from World War I, except the realization that more scientific aid must be employed in keeping weapons up to the standards made possible by civilian technical trends. The end of World War I saw, in plan or prototype form, the elements of many mechanical controls and devices which were later to reach a high stage of development in World War II. But no one with imagination and the necessary scientific skills sought to combine them to form new or improved weapons.

It is true that all countries maintained establishments devoted to the modification and development of weapons. However, these agencies catered only to the wants of the services, as distinguished from their needs. The wants of the services were framed almost invariably against the strategy and tactics of World War I, with minor modifications. Even the German *blitzkrieg* was but an extension of well-known tactics and equipment.

Although all nations were more or less faulty in appreciating how to use science in preparation for war, Germany herself provided a classic example of how to misuse it. To begin with, Hitler's attempts to control national thought drove the

foremost scientists from that country. In organizing the remaining scientific talent within the research establishments set up for the *Reichswehr* during the rearmament period, the German military caste took great care to regiment the scientist into what they considered was his proper place; that is, as a hireling. All consultations between soldier and scientist were highly formal. The scientist gave his opinion only when asked, and served only to carry out the expressed wishes of his military leaders. Under the circumstances, it is a wonder the German forces were reasonably well-equipped.

It remained for Great Britain, among the Western countries, to take the first important step toward a sound organization of science for war. In 1935, the Air Ministry became convinced that existing methods of defense against air attack would not defend Great Britain. A scientific committee was established to study the problem. As a result of this committee's work, radar developed in a few short years to the point where it was able to turn the whole course of World War II. Other committees of the same type sprang up to serve all the forces, and the principle was well established by the outbreak of war.

World War II

Soon after the start of World War II, it became painfully clear to the Western Nations that science might be their only chance of holding and defeating Germany. In Great Britain, scientists were brought into the highest deliberations of state, to help form strategies aimed at enemy technology, or to aid our own. The War Cabinet had its scientific advisers, as did each Chief of Staff. Military-scientific committees and teams framed requirements, and worked in the laboratory and at the front. Research groups studied operations, to improve efficiency and to cut losses greatly. Every gap was filled somehow; but the whole network—which showed the English genius for extempori-

zation and getting things done through unofficial channels—was very difficult to co-ordinate. However, the position of honor held by the scientist in the higher councils served to overcome many difficulties in the lower levels.

In the United States, much the same type of growth took place. There were two marked differences. The closely knit soldier-scientist committee and research team was not so much in evidence, and co-ordination extended to nearly all military research. The National Defense Research Committee, consisting of leading scientists, was formed to direct the activities of some 30,000 scientists, who formed the Office of Scientific Research and Development. The National Defense Research Committee had functions which included the initiation of projects (where necessary), the reviewing of existing military research programs, the placing of contracts to meet expressed military requirements, and the control of money to finance its undertakings.

As the War progressed, Hitler leaned heavily toward science in his attempts to find a decisive weapon. But Hitler merely replaced the directions which his generals had been giving to military science with his own peculiar directions. The essential relationship between the scientist and the military never changed. New weapons went from production into use in a manner which showed that a scientific appreciation of when and how to use them had never been made, nor had the need of doing so been anticipated.

At no stage of the War did the Germans receive aid of any important strategic significance from science. At no stage was German science organized in a coherent manner by anyone with a clear plan in mind. Research talent was wasted on countless unimportant projects, and mad scrambles took place for personnel, priorities, and materials. The Germans soon lost the struggle for technical superiority, and never regained it.

During World War II, the significant factors which control the successful application of science to war emerged, and were tested fully for the first time. These may be summarized as:

1. The necessity for including the scientific appreciation in all higher strategic and tactical planning.

2. The need for a research organization to serve national, as well as purely individual, service requirements.

3. The maintenance of technical superiority in the tactical situation, by means of military-scientific teams, which can initiate research programs, or state the requirement in terms which will enable the research departments to find an adequate answer.

Research Since 1945

At the end of the War, the great majority of the most capable scientists returned to the universities and to industry, leaving the armed forces with depleted research facilities. A skeleton of scientific organization remains, which shows the armed forces have not forgotten completely the lessons of the last War; but in general, it seems inadequate. In Great Britain, a Defence Research Policy Committee advises the Ministry of Defence, and each Chief of Staff still has his scientific adviser. The successor to the National Defense Research Committee remains established in the United States. Its president sits on the National Security Council, which advises the President of the United States. The peacetime National Defense Research Committee has no financial control, and exists, mainly, to monitor the research programs of the armed forces.

How far these agencies influence the strategic planning of their respective countries, beyond the broad implications of scientific warfare, is difficult to assess. It probably is done on an *ad hoc* basis, whenever political or military groups consider that consultation is necessary, or when the scientist sees that something of

overriding importance must be discussed. With the immediate tactical situation no longer in an active form, the military-scientific team has almost passed out of existence, and the armed forces have tended to lapse back into the old familiar ways of expressing requirements in terms of wants, rather than needs.

The threat of a new war, but this time against odds that are even greater, makes it necessary for the West to depend more heavily upon science than ever before. The organization of military science, and the tasks which are set before it, must be decided with great care, since it is the chief advantage the West retains.

It would seem, at first glance, that basic research should be the task for which science must be organized, since this has led to completely new weapons in the past. Unfortunately, during World War II, thousands of scientists scoured the entire field of scientific knowledge in the most intensive search ever made to devise new weapons. It may be many years before basic research yields additional information which would make a radically new weapon possible.

Therefore, applied science must be the keynote of whatever organization is evolved. But the West must be careful to avoid contending with Russian science in the same arena; that is, the battle must not become a technical war to produce weapons having only marginal superiority over those of the opponent. Nor can it become a struggle of production technologies, which would soon impoverish the West, in any attempt to gain parity.

If the best use is to be made of science, a paid council of the most able members of the profession is needed in an advisory capacity to the Government. Its terms of reference would be to analyze the strategic situation facing the West and to decide what it was scientifically and industrially necessary for the Country to do in the circumstances. It would then, perhaps, become obvious that certain lines

of research must be pushed to the limit, to the exclusion of other scientific, military, industrial, or political considerations. The Government could ignore the advice of such a council, if so desired, but it is not likely that any government could afford to do this.

Having indicated the general lines of approach, and having prepared the Government and industry to bear the strain, the question of translating the defense problem into a detailed research program would be passed by the Scientific Defence Council to the scientific member of the Chiefs of Staff. This person would be a full and equal member of the Chiefs of Staff Committee, and would have a normal part in all planning and the formation of strategy and tactics. The development of the weapon and its tactics in meeting the particular requirement would thus go hand in hand.

Some would argue with the appointment of a scientific member to the Chiefs of Staff. It is fully evident today that the development and utilization of modern weapons no longer can be divorced from the place where general strategy is planned. The profound, subtle, and rapid effects which new weapons have on modern war make it imperative to recognize such effects immediately in order to exploit them to the limit. The representative of the designer of the weapon is best fitted to do this. It is not enough to have a scientific adviser to a Chief of Staff; he must be far more influential, owing allegiance to no one branch of the armed forces.

In addition to controlling the armed forces' research programs, the scientific member should have jurisdiction over a Scientific Intelligence Bureau, staffed by scientists. Its primary function would be to watch enemy science and basic research in all countries to seek anything of military significance which might otherwise be overlooked.

Since all requirements will not filter

down from above, the military-scientific team should be reassembled to express the daily requirements which are now too frequently framed by enthusiastic amateurs. In many cases, similar teams would have to be formed to deal with specific research problems, where the armed forces must bring first-hand operational knowledge to the scientist or where tactics must be determined before a new weapon is introduced.

Finally, the organization which employs the military scientist must be designed to attract the most capable men. The improvement of salaries and promotion by merit, rather than civil service seniority, are obvious changes which need to be made. While strict security is a necessary part of weapons development, it must be recognized that scientists regard secrecy as an obstruction. Many existing security regulations are both petty and useless, and should be abolished. Downgrading of security classifications of reports and projects should be made whenever and wherever possible. This would enable the scientist to have knowledge of his work circulated to an ever wider audience and gain for him some measure of recognition which is now impossible.

Many scientists dislike the thought of becoming canalized into one narrow specialty. Some even look forward to turning from applied to basic research from time to time, in order to gain a broader outlook. Care should be taken to give those who desire it a chance to change to other kinds of work every few years. Scientists with a flair for basic research could be loaned to industry or the universities, to pursue investigations which might be of advantage to both parties.

Conclusions

It is clear that in a future war with

the Soviets, the only advantage which the West may possess is a scientific superiority. Lessons of the last two wars have shown that there are correct and incorrect ways of applying a nation's science to war. The proper organization of science is one in which the scientist is not dictated to by governmental or military groups, but where he can give freely of his specialized knowledge to the planning and execution of national and military policies at all levels. Present Western organizations of science for war do not recognize this principle fully.

It is necessary, then, to establish a scientific organization which can decide, in the light of its special knowledge, what needs to be done, and then see that it is done. This could be accomplished by:

1. The creation of a paid Scientific Defence Council, which would analyze the defense problem and determine what policies of research must be followed, within the economic capabilities of the Country.

2. Upon Government approval of the plan recommended by the Scientific Defence Council, a detailed program of research would be implemented for the armed forces by the scientific member of the Chiefs of Staff. The scientific member also would serve as a full partner in the Chiefs of Staff Committee in planning strategy and policies. He would control all armed forces' research and the Scientific Intelligence Bureau.

3. The establishment of military-scientific teams to express armed forces' requirements not otherwise catered to, and to perform such research as is desirable.

4. The improvement of working conditions for the military scientist.

Time is fleeting; the West must move soon.

The Italian Campaign

From Bari to the Sangro

Digested by the MILITARY REVIEW from an article by Lieutenant Colonel O. D. Jackson in the "Australian Army Journal" June 1950.

6-2448

THE Italian armistice on 3 September 1943, apparently had not weakened seriously the German position in Italy. It seemed that the general pattern of defensive operations included the holding of the port of Naples as long as possible, while in the central and eastern sectors the high ground north of Salerno was to be used as a pivot for a general withdrawal. There obviously was little or no hope of a sudden collapse of German resistance.

The immediate Allied objectives were now the important group of airfields at Foggia and the port of Naples. As far as the British Eighth Army was concerned, the scope of its operations had developed considerably from the original intention of securing the Straits of Messina. As a result of the German opposition to the Americans at Salerno, the Eighth Army had advanced to Potenza at great speed, and it was apparent that extensive administrative reorganization and build-up was necessary before any major advance could be undertaken.

In view of the projected advance on Foggia the two main tasks confronting the Eighth Army were:

First, the necessity of switching the administrative axis from the "toe" to the ports in Southeast Italy, namely, Taranto, Brindisi, and Bari. This was a major undertaking and would require both time and heavy commitments in shipping. The port capacities of Taranto and Bari were absorbed largely by troop convoys, and Brindisi could not be opened before 27 September. It became apparent, there-

fore, that the Eighth Army would not be able to operate in strength forward of the present line, Bari—Altamura—Potenza, before 1 October.

Second, extensive regrouping within the Eighth Army was required to transfer the main effort from the west to the east flank. On 24 September, it was agreed that the Salerno beachhead was secure and that the Eighth Army regrouping could begin immediately.

The army plan was now for the British XIII Corps (1st Canadian and 78th Divisions, two armored brigades, and commandos) to lead the advance on Foggia, while the British V Corps (1st Airborne and 8th Indian Divisions, which were arriving at Taranto) was to remain in the Taranto area, and subsequently move forward behind the XIII Corps and protect the west flank. The British 5th Division was to remain at Potenza and form a pivot for the advance and a link with the United States Fifth Army. This division was to remain under the command of the XIII Corps.

No major forces were to move forward of the present general line before 1 October.

The Advance on Foggia

Although no major operations could be undertaken, orders had been issued, on 20 September, for the XIII Corps to dispatch light forces to Spinazzola and Melfi. The V Corps had been ordered to continue aggressive patrolling northward along the east coast axis (see accompanying map).

By 26 September, XIII Corps patrols had pushed through Spinazzola to reach

Canosa and Melfi, while, in the east coast sector, V Corps patrols penetrated far and wide. Elements of the British 78th Division, which had landed at Bari on 22 and 23 September, pushed northward, and by 27 September had driven German rear guard units out of Foggia and cleared the Gargano Peninsula. It now became apparent that the German forces had reorganized sufficiently to make a stand in the hilly country to the north and west of the Foggia plain.

The Advance to the Biferno River

On 1 October, the XIII Corps began its advance from the line Barletta—Canosa with the 78th Division on the coast road axis and the 1st Canadian Division on the left divided into the mountains against Vinchiatturo.

The first serious action was fought across the Biferno River and near the port of Termoli. During the night 2-3 October, commandos were landed at Termoli and a bridgehead was established across the Biferno River. The following night, two brigades of the 78th Division were landed at Termoli to reinforce the commandos.

German reaction to these operations was rapid. The 16th Panzer Division was moved hastily from the Fifth Army front to launch strong counterattacks against both the Termoli beachhead and the bridgehead established across the Biferno River. Bitter fighting took place, and, on 5 October, one of these counterattacks penetrated as far as Termoli itself. During this period, the Biferno River was in flood stage and interfered with the 78th Division's bridging operations preventing the passage of tanks and supporting weapons.

After several days of dogged fighting, in which the Desert Air Force played a valuable part, the situation was restored, and, on 7 October, the German forces withdrew northward to the Trigno River line. Here, positions covering the river were

established by the 16th Panzer Division, plus elements from the 26th Panzer and the 1st Parachute Divisions. As had been expected, the administrative situation again forced a pause before the advance could be resumed.

On the left, the 1st Canadian Division had made slow progress in the difficult mountainous country, and it was not until 10 October that Vinchiatturo was taken. Here again, administrative considerations precluded any further immediate advance.

The thrusts launched by the 78th and the 1st Canadian Divisions had now diverged considerably and the front had become too wide for control by one corps. Accordingly, extensive regrouping was carried out. The V Corps took over the coastal sector including the 78th Division, while in the XIII Corps, on the inland sector, the 5th Division was brought forward from Foggia to operate on the right of the 1st Canadian Division. Thus, the frontage had been increased from two to three divisions and there now were two corps forward. In addition, the 2d New Zealand Division was arriving at Taranto, where it was to remain, temporarily, in army reserve.

The Advance from the Biferno River

The next task allotted to the Eighth Army was to advance to the eastern sectors of the Rome line, that is the road running east-west across the peninsula from Pescara to Rome. There were two major factors controlling the planning of this advance:

1. The administrative organization had not been able to keep pace with the operations as they had developed.
2. The usual severe Adriatic winter was setting in and there was no time to lose, since winter conditions would favor the German defense. Progress off the main roads would be impossible owing to mud and snow, while heavy rains in the mountains would create enormous bridging difficulties. In addition, air operations

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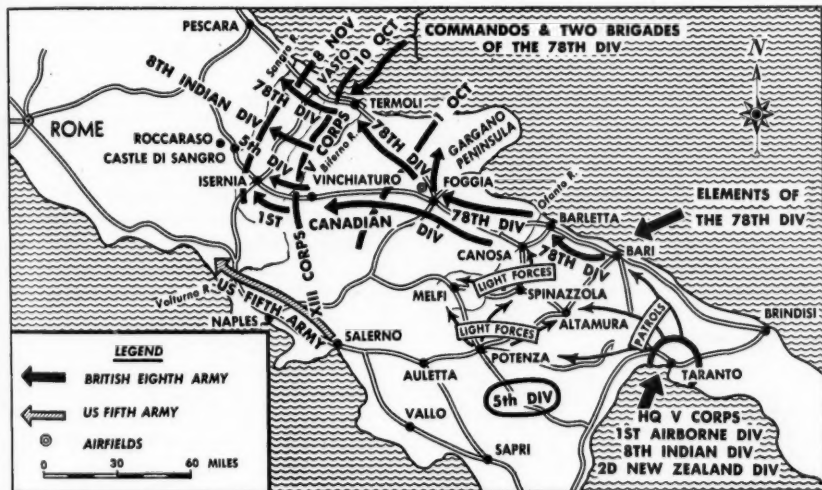
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would be limited severely by poor visibility.

The most serious factor, however, was the obvious intention of the German command to contest vigorously the Allied approach to Rome. The general withdrawal had ceased, German reinforcements were

October. It was anticipated that no great difficulty would be experienced in crossing the Trigno and the V Corps was ordered to carry its attack through to the major German defense line, which was being prepared covering the Sangro River.

To safeguard the Foggia airfields and



arriving, and the Allied advance was meeting determined opposition across the whole front.

In mid-October, while the Eighth Army was making preparations for the resumption of its advance, the Fifth Army had fought its way across the Volturno, but German resistance continued to strengthen. The Eighth Army was now opposed by four divisions grouped into the LXXXVI Panzer Corps (16th and 26th Panzer, 29th Panzer Grenadier, and 1st Parachute Divisions). The army plan now entailed divisionary operations by the XIII Corps against Isernia on the western flank, followed by a strong thrust, in the east, by the V Corps to cross the Trigno River. The XIII Corps was to advance from Vinchiatturo, on 28 October, and the V Corps thrust was to begin on the night of 30-31

to provide a firm base, the 2d New Zealand Division was ordered forward to the Foggia plain.

Bad weather and successful patrol action caused changes in the army plan. On 22 October, the 78th Division obtained footing across the Trigno, but, owing to heavy rain which followed, this bridgehead could not be reinforced and the opportunity was lost. The rain also forced a 1-day postponement of the XIII Corps advance in the west.

On the night of 2-3 November, the V Corps attack across the Trigno began with the 78th Division on the right and the 8th Indian Division on the left. During sions made steady progress in spite of firm resistance. The German forces then began to withdraw to the Sangro.

By 8 November, the 78th Division had

established itself on the high ground overlooking the river from the south and the following 2 days and nights, these divisional Indian Division was moving up on its left.

To the west, the XIII Corps had continued to advance in the face of strengthening German resistance. Mountain villages had been fortified and used as holding positions, which the XIII Corps found difficult to reduce. When forced to withdraw, the Germans had destroyed all available accommodations so that the attacking troops found little in the way of shelter against the rain and wind, and the inevitable extensive demolitions also had caused long delays. By 8 November, the XIII Corps had taken Isernia.

Once again, a pause for administrative reorganization was necessary before a major attack could be launched across the Sangro River.

Conclusion

There are two highlights which are immediately apparent in any review of these preparations:

1. A loss of flexibility in the Eighth Army, due to the inability of the administrative organization to keep pace with the speedy advance.

2. The excellent results achieved by the light forces during the advance from Potenza and Taranto to the Foggia plain.

With regard to the administrative situation, it should be noted that it was this factor which caused the pauses at the Cantazaro "neck," on the Bari—Potenza line, at the Biferno River, and again at the Sangro River. Further, during the advance from Potenza to Foggia, it caused the Eighth Army to reduce its strengths in the forward area to light forces only.

These limitations not only gave the German forces time to reinforce their front, and to establish defenses above the Foggia plain and north of the Sangro River, but even more important, they were the direct cause of the situation in which the Eighth

Army now found itself. With winter closing in, the army was faced with a major battle at the Sangro before they could close up to the Rome line. The possibility of a quick break-through of the Rome line was now very remote.

It is important then to examine the reasons behind these administrative weaknesses. They may be summarized as:

1. The rather nebulous appreciation for the development of operations after the assault landing. To quote Major General Frederick de Guingand, General Montgomery's chief of staff, "I don't say the High Command had an easy task, but I believe that greater administrative foresight might have avoided some delay." Further, the landing of the V Corps in the Taranto—Bari area had been carried out on short notice, and the scale of administrative support allotted to it had been a minimum one.

2. The Eighth Army build-up had been incomplete, as a proportion of the units and supplies originally allotted to the army had been diverted to Operation *Avallanche*, while the complete priority awarded to the Fifth Army had absorbed such reserves of administrative resources as were available in the Mediterranean. The planned rate of build-up had been reduced further by the withdrawal of a large proportion of the already slender resources of shipping and craft in preparation for the assault on Normandy.

3. The effects of the mountainous country combined with the extensive German demolitions, which required the forward movement of enormous quantities of Bailey bridging, plus other engineer equipment, and caused considerable difficulties in the movement of large numbers of troops and quantities of stores over the meager lines of communications.

All these considerations point to one of the most important lessons of the campaign in Italy, namely, the absolute necessity for a great deal of forethought and

careful administrative planning at all levels, together with the provision of adequate resources to enable the administrative machine to function efficiently.

The second highlight of these operations is the advance of the light forces. The lesson is not so much what they achieved, but rather the manner in which they achieved it. Their success was due, mainly, to the rapidity of their advance and their bold offensive spirit. This is an excellent illustration of the sound use of two basic principles, flexibility and offensive action. Admittedly, German opposition was very light, but there is little doubt that, had the British advance been limited to the speed of the main forces, this opposition would have been much stronger and the Germans would probably have been able to reorganize more quickly and establish defenses farther south than they actually were able to do.

A more detailed examination of this phase of the operations reveals at least four more important features:

1. The rapid regrouping after the capture of Potenza, and the switching of the main axis of attack from the central sector to the east coast sector, again provides proof of the high standard of staff planning and movement control achieved in the Eighth Army. These attributes are even more apparent when consideration is given to the difficult terrain over which

the forces were moving, the paucity of communications over which the administrative echelons had to operate, and the inadequate resources available in the forward area, particularly with regard to transport columns.

2. As in the Sicilian operations, it is clear that the operations again were designed to secure the main centers of communications as quickly as possible, for example the road and railway centers at Potenza, Foggia, Vinchiaturro, Isernia, and Termoli. In this way, the power of maneuver of the British forces over the difficult terrain was increased and the flexibility of the German defense proportionately decreased.

3. The seaborne assault action of a commando unit and two brigades of the 78th Division at Termoli provides excellent examples of the use of flexibility borne of the control of sea and air, to enable an attack to be delivered from an unexpected direction. It was unfortunate that adverse weather conditions prevented the exploitation of the initial advantage gained.

4. The destruction of accommodation facilities by the Germans during their withdrawal up the Appenine range caused the troops of the XIII Corps to suffer great hardships and brought home the necessity for the provision of shelter for troops exposed to severe climatic conditions.

The modern soldier, like his counterparts in the Navy and the Air Force, is more dependent than ever before upon the complex machines of modern war. For the combat soldier of today no longer marches into battle—instead he enters the battlefield by truck, from planes, or aboard a tank.

General J. Lawton Collins

The Functions of Air Power

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Digested by the MILITARY REVIEW from an article by Lieutenant Commander G. W. R. Niholl, Royal Navy, in the "Royal Air Force Quarterly" (Great Britain) January 1950.

AIR power and sea power, in the maritime sphere, are not two different and contending things. The first, it is submitted, is merely a weapon by which the second can be achieved. Control of the air above the sea finally has become recognized as being an essential prerequisite to successful surface action. But what is also important, if the exercise of sea power is to be fully efficient, is the way in which the air weapon is wielded and, in the final analysis, the qualifications and training of the men who actually do the wielding. The same is true of the military aspect. Because much loose thinking out loud still can be heard on this subject, it may help if we go back a bit in recent history for the possible causes.

Introduction of New Arm

Before the development of aircraft, the boundaries of the two more tangible elements were quite clear-cut; militarily as well as physically. When the interests and activities of the two services tended to converge or overlap, it was simple to arrive at a sensible and amicable agreement. Broadly, the Army protected the Navy's bases, while the Navy assumed responsibility for the safe passage of troops and arms across the oceans. But with the coming of the war plane, the ubiquitous nature of its natural habitat appeared to throw military thought into confusion.

At first there were those (as always) who contended that the claims of the new protagonists were as tenuous as the air in which they placed their faith. As far as our services are concerned, the official record of the early controversies is not easy to reconcile. But was the struggle to establish a separate Air Force as difficult as it is now represented? Arrayed

against the Air Force were the powerful and more senior heads of the established services. If they had had anything more than the weakest faith in the air weapon and anything more than the weakest arguments for its retention in existing form, they surely must have prevailed. In other words, future historians may consider that it was short-sightedness in the Navy and Army which resulted in disowning and casting off an arm which later was to cost them dearly.

Co-operation between the services, on the scale that was soon to be needed, was negligible. Each talked a different language. Indeed, these things were no cause for great surprise at the time, being the logical consequence of assumptions based on a false premise. Past experience had shown that the military and naval forces largely could conduct their own private wars with minimum co-operation and consultation. True, there was now a third force, but presumably it could be left to deal with its own responsibilities in a similar manner. So appeared to think those who had misread or ignored the writing on the wall. Preparations for the next war seemingly were being made in anticipation of a start at the point at which the last War ended.

Meanwhile, the new third force went ahead vigorously along the lines in which it so fervently believed. If progress in the development of the new power was remarkable, it was all the more understandable if enthusiasm was sometimes too far ahead of the evidence of the aircraft's current abilities. Nothing is so satisfying as an increasing conviction that you are right. Progress indeed was so rapid that the faith of the skeptics, who had elected to take independent

courses, began to be shaken. It was not long before a gesture was made to a less confidently viewed future—the first few flights of the Fleet Air Arm and the Army co-operation squadrons came into being.

But the major error here was that neither the Navy nor the Army had senior

view the subject objectively, if critically, from that standpoint. It, therefore, should not come amiss at this point to return to earlier advice and make clear what are considered to be the basic functions of the three arms. Successful sea or air battles do not win wars. Only the land arm can do that by virtue of its ability



The Normandy invasion was an outstanding example of co-operation between the armed forces. Above, airborne troops passing over Allied ships bombarding the French coast.

officers with the necessary knowledge or experience for using this weapon. Nor were any transferred to the Navy when complete responsibility later was assumed by the Admiralty for naval aviation. At the same time, the Royal Air Force, chiefly concentrating on evolving new conceptions of strategy and tactics, had lost touch with developments in the purely naval and military spheres. The two new sub-arms, therefore, got off to a bad start, wholeheartedly and intelligently nurtured by none.

New Concepts

If a change of view now appears to take place, it is done in no partisan spirit. Modern war is not divisible. We are but the combative branches of a larger fighting organization, and so we endeavor to

to consolidate victory, which, in practice, is the role of the infantryman. And it presumably is accepted that he is functionally no less an infantryman for being dropped on his objective from the skies or ferried to it across the sea in ships. That admitted, it is not an oversimplification to state then that the clear duty of the other arms should be to conduct their actions so that they are directed inevitably and inexorably toward enabling the infantryman to achieve his objective. Pet schemes and other issues which do not have this in mind can have no place in sound planning.

The arts of land and sea (no less than air) warfare demand the study and training of years if they are to be mastered. Increasing complexities of war make this

true today. The last War proved the vital need for each to have the air weapon if they were to prosecute their respective parts successfully, or at all. As has been said, the air weapon is not something alien in these two spheres: it is now an integral part of the fighting machine of each. But if that weapon is wielded by a service brought up literally and figuratively in another atmosphere, it surely must be acknowledged that the result will not be as efficient or effective.

That it *did* finally prove sufficiently effective to enable us to win the last War is no argument that it cannot be improved upon. There are many examples of its inefficiency in the early stages. The unfortunate misunderstanding with the Navy over the interpretation of the word "control" with regard to directing the fighter escorts for coastal convoys, which resulted in months of delay, is but one illustration of the language difficulty. The beginning of the North African campaign provides another example. Owing to misconceptions and ignorance of the scope of air tactics, on the one hand, and military requirements, on the other, it became necessary for the RAF staff to go and live in actual physical contact with their opposite numbers of the Eighth Army. A routine tour of duty of 2 or 3 years in the Tactical Air Force or Coastal Command before being posted elsewhere does not give sufficient time to master the military or naval subject.

The use of air power in the military sphere is not now a side issue with the Army; it is the spearhead of their attack and the buckler of their defense. The same applies to maritime warfare. In the latter connection it should be noted, of course, that carrier-based aircraft play only a specialized role in that aspect of air power. But for the RAF, it is contended, these are side issues, subsidiary or detrimental to their main role.

Exception must be taken, for the rea-

sons given, to the assertion that "naval air" should not be regarded as something different from the other "air." It is different, as much as each in turn is different from "military air." To argue an unalterable fact only can lead to a dissipation of effort; to recognize it, on the contrary, must strengthen all arms which steadily hold in sight the grand objective.

Tactical Air Forces

If the Tactical Air Force should come entirely under the Army and the Coastal Command under the Navy, it may well be asked by some: "Where, then, does the RAF, as such, come in?" The answer to that is, for the fulfillment of the two supreme roles, two roles that are accumulating ever increasing importance because of the enigma that faces all peace-loving countries today. The responsibility, first, for prosecuting the medium and long-range bombing policies, and, second, the fighter defense of the homeland and the bases from which the general fighting organization has to operate. If the second is effective against an aggressor, the only hope of ever regaining the initiative lies in the first having an efficiency of the highest order. These two problems are not, basically, naval or military ones.

In this atomic and supersonic age, the traditional opening gambits of past wars surely have gone for ever. Hiroshima marked the passing of that era. No more will there be the formal declarations of war, the "phoney" periods, the feints and testing probes at distant perimeters, and the long, drawn out methods of attrition. The boomerang consequences of mistiming or misplacing the first paralyzing, if not annihilating, blow are so dire that a potential aggressor must be prepared to gamble his all on it. With a weapon in his armory that is capable, if properly used, of stilling the heart of his objective, he knows that a convulsive reflex action of the limbs must soon die away.

To such depths has our civilization apparently fallen that we must guard against treachery of the subtlest kind.

If we do not consider defense against this form of attack and *immediate* retaliatory measures as constituting the two supreme military problems of the times, then our days seem, without a doubt, to

be numbered. And, the time factor being what it is, only air power is seen as being capable of providing the answer. To think and act along more conventional lines will lead to the perpetuation of the old mistake: planning the next war from the point at which the last one ended.

Weapon Production in Switzerland

Translated and digested by the MILITARY REVIEW from an article by Tor Skjervagen in "Militær Orientering" (Norway) 15 November 1950.

SWITZERLAND, although a small country, has made incredible progress in the industrial field. Its production of fine watches is well-known and, therefore, it is not surprising to learn that this Country carries on a comprehensive research and experimental program for the purpose of producing better and more efficient weapons.

The main armament center, the Federal Armament Design and Construction Works, is located at Thun, approximately 15 miles from Berne. It is located ideally for this type of production, for it occupies the site of a former artillery range, and is adjacent to a large military installation. The works was founded in 1865 and, since that time, its installations and activities have increased steadily. Primary emphasis is on research and development, rather than production. Efforts are made to develop new weapons and to discover the most efficient methods of production.

The development of heavy artillery occupies the major effort of the works, but research also is conducted on other weapons, with the exception of hand weapons.

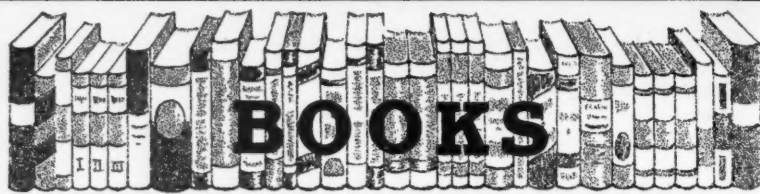
The specialized equipment used at the works requires the services of well-trained personnel. New personnel receive

1-year's training at the works' special craftsman's school and then they are sent to the various departments in the works for an additional 3-year period before being assigned to definite positions.

Military training also receives an important role in the training of the new personnel. Noncommissioned officers conduct special classes, and the personnel wear military uniforms.

The works also is connected with the ballistics research and experiments conducted for the Army. Interior and exterior ballistics, weights of projectiles, and various propelling charges are studied to determine the maximum efficiency for each weapon. All matériel is checked in a special testing establishment to determine the effects of temperature and vibration—important factors in modern warfare. The information which is obtained from the research in the works is checked in the field by the Army.

Only an expert can appraise definitely the work being done in the Swiss armaments works. But the average individual, observing the gigantic program in action, readily can understand the importance of the program and the reasons why the Swiss are proud of this portion of their industrial effort.



BOOKS

FOR THE MILITARY READER

CHIEF OF STAFF: PREWAR PLANS AND PREPARATIONS. By Mark S. Watson. 551 Pages. U.S. Government Printing Office, Washington, D.C. \$3.75.

By LT COL MICHAEL PAULICK, *Inf*

This book is an official history of the Office of the Chief of Staff, United States Army. In a large sense, it is also the story of General George C. Marshall, Chief of Staff from September 1939 to November 1945.

This scholarly and objective report portrays the problems facing a democracy in maintaining an adequate military posture in the world. Public opinion has restricted decisively the size of our armed forces in peacetime through minimum appropriations. This same public pulse, when national security is seriously jeopardized, demands military might second to none regardless of cost. As pointed out by Mr. Watson, this had been our position preceding both of the last two major wars.

"In their preliminaries, developments, and immediate sequels World War I and World War II followed a cycle whose phases are well marked. . . ."

The Army itself was aware of its weakness, and a number of chiefs of staff attempted to correct the situation. In 1933, General Douglas MacArthur, then Chief of Staff, rated the US Army as seventeenth among the world armies at that time. In 1939, General Malin Craig, in his annual report as the Chief of Staff, stated:

"Time is the only thing that can be irrevocably lost, and it is the thing first

lost sight of in the seductive false security of peaceful times. . . . The sums appropriated this year will not be fully transformed into military power for 2 years. Persons who state that they see no threat to the peace of the US would hesitate to make that forecast through a 2-year period." However, the task of building up the Army fell to the lot of General Marshall, who succeeded General Craig as the Chief of Staff. The success of the American Army in World War II stands as a monument to him and to the officers with whom he surrounded himself during the trying period of the rebirth of US military power.

In the light of the current world situation, Mr. Watson's history of the complex problems facing the Chief of Staff in the years preceding World War II should be studied by all persons interested in national security. Once again, national security is seriously threatened and similar problems are being encountered and must be solved.

Mr. Watson is no stranger to the readers of the *MILITARY REVIEW*. Chapter IV, *Foreign Policy and the Armed Forces* appeared in the August and September issues of the *REVIEW* in 1950; and Chapter XI, *The Victory Program*, appeared in the March and April issues of the same year.

THE MAN OF INDEPENDENCE. By Jonathan Daniels. 384 Pages. J. B. Lippincott Company, Philadelphia. \$3.75.

THE THEORY AND PRACTICE OF HELL.

By Dr. Eugene Kogon. Translated from the German by Heinz Norden. 307 Pages. Farrar, Straus and Co., New York. \$4.00.

By IVAN J. BIRNER, Ph. D.

This volume is subtitled, *The German Concentration Camps and the System Behind Them*. It accurately describes the book.

The Theory and Practice of Hell is not another atrocity story although it includes a full and sickening account of the whole atrocity mess. It is not another "I was there" account, although the author was a "concentrationary" of 7 years' experience. This volume is a deliberate, methodical account of the concentration camp system written by a professionally trained sociologist. Considering that the author was a victim of the system, his account shows a remarkable degree of objectivity.

This volume is divided into three major parts. It commences with a short introductory chapter, "The Aims and Organization of the SS Super State." This is followed by a detailed description of the concentration camp system. The chapter titles indicate the content: "Admission to the Camps and Duration of Imprisonment"; "Daily Routine"; "Food"; "Money and Mail"; "Sanitation and Health." . . . The story, relentlessly told down to the fine details, makes a lasting impression. As an example, in the chapter on "Money and Mail": "Kubitz, a Buchenwald Block Leader, sometimes came into Barracks 36 with a stack of mail for the inmates. He would read off the names and then slip the whole stack into the stove, saying: 'Now you know you've had mail, you swine'."

In the latter part of the book the author changes from factual reporting to a sociological-psychological account. He tackles the difficult problems of interpersonal relationships among prisoners,

among guards, and the interrelationships between the two.

The Theory and Practice of Hell is the whole sordid concentration camp story wrapped up in a readable package. Current events make the concentration camp story a practical concern. The reader will remember the author's statement: "Their [the concentration camps] main purpose was the elimination of every trace of actual or potential opposition to Nazi rule." We can substitute for the proper adjective.

THE GOVERNMENT AND POLITICS OF CHINA. By Ch'ien Tuan-sheng. 526 Pages. Harvard University Press, Cambridge, Mass. \$7.50.

The rise and decline of Nationalist China since 1911. Essential reading for a clear understanding of the Communist regime and the rise and decline of Nationalist China. Illustrated with 2 maps and 5 charts.

THE ECONOMICS OF FREEDOM: The Progress and Future of Aid to Europe. By Howard S. Ellis, assisted by the Research Staff of the Council on Foreign Relations. With an introduction by Dwight D. Eisenhower. 549 Pages. Published for the Council on Foreign Relations by Harper & Bros., New York. \$5.00.

MEASUREMENT AND PREDICTION. By Samuel A. Stouffer and others. 756 Pages. Princeton University Press, Princeton, New Jersey. \$10.00.

Methods used in the study of social psychology during World War II.

THE ADMINISTRATION OF AMERICAN FOREIGN AFFAIRS. By James L. McCamy. 364 Pages. Alfred A. Knopf, New York. \$5.00.

A DECADE OF AMERICAN FOREIGN POLICY. Prepared by the Department of State. 1,380 Pages. U.S. Government Printing Office, Washington, D.C. \$2.75.

Basic documents, 1941-49.

THE FRONT IS EVERYWHERE. By Lieutenant Colonel William R. Kintner, Inf. 274 Pages. University of Oklahoma Press, Norman, Oklahoma. \$3.75.

By MAJ JAMES A. KLEIN, Inf

"The conquest of political power demands that elimination of all will to resist, and the elimination of all will to resist communism requires the use of organized force. Just as armies which use organized force to destroy the enemy's will have a commonly recognized military structure, so must a party which aims to gain its objective by organized violence have a similar military form." So states Colonel Kintner in this well-documented volume on the Communist Party and how it functions.

Kintner's fundamental premise is that the Communist Party is primarily military and not parliamentary in its organization and is directed by a General Staff located in the Kremlin.

The author traces the historical developments of the military character of communism from its inception, during the French Revolution, to Stalin. All of this supporting material is used to prove the author's main thesis that not the ideas but the military organization and tactics of communism are the really dangerous threat to our way of life.

Kintner points out the methods by which communism can be controlled in this Country through constitutional means. Unlike more excitable critics, he advocates wider reading of Communist literature so that the world-wide party organization and its ideas can be combated more intelligently by our people and the leaders in government.

The Front is Everywhere is a calm, intelligent analysis of communism and deserves careful reading by all officers.

AIR TRANSPORTATION—TRAFFIC AND MANAGEMENT. By Thomas Wolfe. 725 Pages. McGraw-Hill Book Company, New York. \$8.00.

LIFE'S PICTURE HISTORY OF WORLD WAR II. By the editors of Life. 368 Pages. Simon and Schuster, New York. \$10.00.

By LT COL DONALD T. KELLETT, Inf

This volume represents an impressive attempt to compress the enormously complex history of World War II into an annotated pictorial panorama comprehensible to the average reader.

The difficulties in attempting to chronicle the global aspects of the great conflict are those inherent to any "capsule treatment." Therefore, the veteran may feel that however handsome the effort, *Picture History* tells less than was expected.

The photography, derived from all available sources, is magnificent and adequately complemented by art work. The textual continuity is authorized by Robert Sherrod and John Dos Passos. Some military readers may be disturbed by terse captions representing the journalistic interpretation of a tactical situation.

While it should be interesting to everyone, the *Picture History* is of limited value to the military reader, chiefly as a result of the necessarily brief coverage of specific incidents of the War.

Of definite value to all readers will be the picturization of the scope and magnitude of World War II. The civilian veteran (industrial or military) who was intensely oriented within his particular sphere of participation should now discover and appreciate that his neighbor's task was important too, even though it may have been on the other side of the world.

THE OCCUPATION OF JAPAN. Second Phase: 1948-50. By Robert A. Fearey. With a preface by Joseph C. Grew. 230 Pages. Published under the auspices of the Institute of Pacific Relations. The Macmillan Company, New York. \$3.00.